2.3 WASTE ANALYSIS PLAN

This Waste Analysis Plan has been developed to address the requirements in 40 CFR 264.13, 40 CFR 268 and 22 CCR 67102. Implementation of this plan will allow the LAIDLAW ENVIRONMENTAL SERVICES, LOKERN FACILITY to:

- Obtain sufficient information to determine whether the wastes considered for management fall within the facility's permits.
- Obtain sufficient information about incoming wastes accepted to properly manage the wastes after receipt.

To accomplish these goals, this Waste Analysis Plan outlines wastes that may or may not be accepted at the facility, acceptance criteria for each type of Waste Management Unit, sampling and characterization procedures that will be conducted in predisposal (preacceptance) evaluations for waste streams, onsite waste verification of incoming loads, post-treatment verification, and periodic update waste evaluations.

For each candidate waste stream, a generator is required to supply a Predisposal Evaluation form (Exhibit 2.3-1) and a representative sample of the waste. LAIDLAW ENVIRONMENTAL SERVICES, LOKERN FACILITY reviews the information supplied by the generator and performs "required analyses" and "additional analyses" as necessary on the candidate sample to determine if the waste stream is acceptable for treatment/disposal at LAIDLAW ENVIRONMENTAL SERVICES, LOKERN FACILITY. If the waste stream is acceptable, a Waste Verification Information (WVI) form (Exhibit 2.3-5) is prepared by the Waste Acceptance Manager or designee. Incoming loads of the waste stream are sampled and checked to verify that the manifest information is consistent with the waste description on the Predisposal Evaluation form and that the incoming waste

matches the information on the Waste Verification Information form. Incoming waste loads that are verified to match the waste verification information are accepted at the facility and routed to the appropriate Waste Management Unit within the LAIDLAW ENVIRONMENTAL SERVICES, LOKERN FACILITY.

In this plan, a California hazardous waste is a waste designated as hazardous by the DHS, but not by the EPA in 40 CFR 261. EPA hazardous wastes are considered hazardous by both the EPA and the DHS. A California nonhazardous waste is considered nonhazardous by both the EPA and the DHS.

2.3.1 Identification of Wastes

The facility will accept those wastes which are approved for disposal or treatment at LAIDLAW ENVIRONMENTAL SERVICES, LOKERN FACILITY under permits currently held by the facility. Those wastes accepted for disposal must conform to general waste descriptions contained in the present Department of Health Services and U. S. Environmental Protection Agency permits and under the current Waste Discharge Requirements. Those general descriptions are as follows:

Soil and nonsoil materials contaminated with petroleum derived fuels and lubricants
Drilling muds and cuttings
Produced water
Boiler blowdown sludges
Oil
Oily waste
Water softener wastewater
Well wash water
Acids
Caustics
Soda ash
Oil sump sludge
Gas scrubber wastes
Spent filter media
Spent refinery catalysts
Elemental sulfur

Refinery coke
Refractory liner
Asbestos insulation
Refinery maintenance wastes
Fly ash
Tank bottom sediments
Cooling tower sludges
Soils and nonsoil materials contaminated with any of the above

These general waste descriptions may include the following categories of waste:

- California hazardous waste as defined in 22 CCR 66693
- EPA hazardous wastes listed in 40 CFR 261
- Special waste as defined in 22 CCR 66195 and 66740
- Ignitable and reactive wastes as defined in 22 CCR 66702 and 66705, respectively.

In addition, the facility will accept the following specific hazardous wastes to the extent allowed by variances, treatment standards and other criteria:

- Restricted wastes listed in 22 CCR 66900 and 40 CFR 268
- Wastes with heating values of more than 3,000 BTUs per pound
- Waste with volatile organic compounds with concentrations greater than one percent as defined in H&SC Sec. 25155.5.

Individual waste management units may have different acceptance criteria (e.g., land disposal restriction of the landfills).

In addition, nonhazardous wastes will be managed at the facility.

The Facility will also receive waste materials resulting from the retrofitting and closure of existing onsite waste management units.

2.3.1.1 List of Acceptable Wastes

Table 2.3-1 is a list of the major waste or waste types that have historically been managed by the facility. In addition, the wastes listed in the Part A permit application (as submitted with this Part B) may be accepted for treatment, storage and disposal if the waste characteristics do not preclude acceptance. Waste codes associated with the Toxicity Characteristic Leaching Procedure (TCLP) are also listed (see Table 2.3-2). Nonhazardous waste will also be managed at the LAIDLAW ENVIRONMENTAL SERVICES, LOKERN FACILITY in nonhazardous disposal units not covered by this permit.

2.3.1.2 List of Unacceptable Wastes

The wastes that will not be accepted for treatment or disposal include:

- Infectious waste
- Radiological waste
- Chemical toilet waste
- Putrescent waste
- Polychlorinated biphenyl (PCBs) materials containing concentrations greater than or equal to 50 mg/kg (ppm) PCB
- Class A explosives
- Dioxin-contaminated wastes defined in 40 CFR 261 (FO20, FO21, FO23, FO26 and FO27).

Table 2.3-2 lists chemical properties or characteristics that will preclude the acceptance and management of untreated waste in land disposal units without prior approval from the Department. Wastes exceeding the limits shown in Table 2.3-2 may be accepted into the STU, the WSU, or the MITS if the resulting treated wastes meet state and federal land disposal restrictions.

2.3.2 Waste Treatment Unit Description

The LAIDLAW ENVIRONMENTAL SERVICES, LOKERN FACILITY (EPA ID No. CAD980675276) is a Class I disposal facility. Modernization of the facility will result in the following hazardous waste management units:

- Landfills for disposal of solid waste
- Stabilization/Treatment Unit (STU) and related above-ground tanks for hazardous waste treatment to meet land disposal criteria.
- Waste Stabilization Unit (WSU) for the solidification and stabilization of wastes prior to land disposal, which meet land disposal criteria.
- Modular Inorganic Treatment System (MITS) to treat liquids to nonhazardous standards prior to disposal in nonhazardous surface impoundments.
- Bin Top Solidification to solidify loads which are predominately solid which exhibit free liquids and already meet all land disposal criteria.

These units, which represent a modification of the facility to conform to federal and state regulations for minimum technology standards and land disposal requirements are briefly described below:

- Landfills - Eleven landfills having a total capacity of approximately 5,400,000 cubic yards will be constructed at the facility. The landfills have been designed to include a series of multiple synthetic liners, compacted clay liners, leachate collection and removal systems, and vadose zone monitoring systems.
- Stabilization/Treatment Unit - The STU is designed to receive, store, and process wastes that cannot be disposed of directly in a landfill. The STU treatment processes will modify chemical and physical characteristics of the wastes to allow subsequent placement in a landfill. The STU will include a truck wash station, bulk waste unloading bays, liquid waste receiving/treating tanks (Phase II), a facility for receiving containerized wastes, waste processing equipment and treated waste handling equipment. During

Phase I operations, wastes will undergo hydration/pozzolanic reaction to chemically remove free liquids and to reduce the leachability of ionic species. The Phase II wastewater treatment processes will include oil removal from liquids and sludges; neutralization of acidic or caustic wastes; and hydration/pozzolanic reaction to chemically remove free liquids and to reduce the leachability of ionic species. The process equipment will include a pugmill, auger shredder and a series of conveyors and hoppers to process the wastes. Tanks will be used to store various types of materials such as incoming waste receipts, various additive materials, and wash water.

- Waste Stabilization Unit - The WSU will pretreat wastes prior to land disposal. The WSU will be capable of treating solids, semisolids and some liquids by blending cement or other solidification agents with wastes. The unit will consist of a pug mill and/or equivalent, associated conveyors, waste feed hopper, treated waste holding area, and silos containing additives. The solidified waste will be removed from the unit for disposal in a landfill. The WSU has been designed to address the immediate needs for solidification of wastes prior to land disposal.

- Modular Inorganic Treatment System - The MITS will treat certain California hazardous liquids and RCRA wastes to nonhazardous levels or below Landban criteria by neutralization and metals precipitation. The treated liquids will be discharged to nonhazardous surface impoundments. The MITS consists of a series of tanks where treatment chemicals are added and mixed with the wastes and solids are allowed to settle.

- Bin Top Solidification - Solidification agents will be added to predominately solid loads which exhibit free liquids because of settling out through transport and/or adverse weather conditions. The solidified California hazardous and/or nonhazardous waste will be disposed into a landfill.

In addition to these proposed new hazardous waste management units, the LAIDLAW ENVIRONMENTAL SERVICES, LOKERN FACILITY, currently includes:

- An office/administration area

- An analytical laboratory/waste verification laboratory and sampling area
- Truck receiving/sample receiving office
- An equipment maintenance and storage area
- Water management facilities
- Nonhazardous surface impoundments.

Truck receiving and handling facilities include weigh scales, a sampling area and a drivers waiting area.

The analytical/waste verification laboratory is located next to the truck receiving/sample receiving office. The capabilities of the facility laboratory will include at a minimum:

- Metal analysis using atomic absorption spectrometry techniques
- Inorganic analysis using classical wet chemistry methods
- Organic analysis using Gas Chromatography (GC) and Mass Spectrometry (GCMS).

Facility records pertaining to the analysis and placement of waste at the facility will be managed by the Facility manager or designee, and integrated into the records management system. Files will include manifests and Waste Transmittal Forms. The predisposal analysis reports and all QC/QA documentation pertaining to the laboratory instruments will be included in the records management system.

2.3.3 Hazardous Waste Management Unit Process Tolerance Limits

Tolerance limits have been established for each hazardous waste management unit at the facility for optimal performance of the units, prevention of uncontrolled reactions and compliance with regulatory restrictions. These limits provide the criteria and

logic for selection of parameters for waste analysis and sampling protocol. These limits should not be considered as absolute and unchangeable and may be revised due to new waste streams, market conditions and/or new regulations. Continued acceptability and compatibility of wastes in the units will be evaluated when revising the limitations.

2.3.3.1 Landfill

The wastes placed in landfills must be compatible with the synthetic liners and with the uppermost lift of previously landfilled waste. Treated waste undergoing final placement in a landfill will contain no free liquids, be non-ignitable and non-reactive, and not be restricted from land disposal and 22 CCR 66900 and/or 40 CFR 268. Drums will be crushed or shredded prior to placement in the landfill. Solid and/or sharp objects will not be placed within three feet (vertically) of the uppermost synthetic liner. Each load of treated waste placed in the landfill following on-site treatment will be placed into a documented temporary landfill location. Following verification that a load of treated waste meets the appropriate treatment standards, the waste will either be moved to its final location in the landfill or the temporary location will become the wastes' final location in the landfill and be recorded as such.

2.3.3.2 Stabilization Treatment Unit

The STU will only process waste receipts amenable to stabilization and/or treatment as determined in bench-scale treatability testing. Extremely acidic solutions (pH <1) will not be accepted due to material corrosion limits. Wastes containing free liquids with pH less than 3 will not be placed in concrete storage bins. Ignitable wastes will only be accepted in the waste liquid receiving tanks constructed of steel and equipped with explosion-proof pumps and motors.

Wastes that are incompatible will be stored and processed separately. Storage bays or tanks which previously held an incompatible waste will be cleaned prior to placement of other wastes for storage or treatment.

2.3.3.3 Waste Stabilization Unit

The WSU will only process waste receipts amenable to stabilization/solidification as determined in bench-scale testing. Ignitable wastes will only be accepted in the waste-receiving tank constructed of carbon steel and equipped with an oil-skimming device. The stabilization treatment process is limited by high concentrations of soluble salts, sodium salts, or sulfates because these constituents may retard the curing time.

Wastes that are incompatible will be stored and processed in separate batches. Storage bins or tanks that previously held an incompatible waste will be cleaned prior to placement of other wastes in the units.

2.3.3.4 Modular Inorganic Treatment System

The MITS will process those California hazardous wastes and RCRA wastes that are liquid and that can be rendered nonhazardous or to levels below treatment standard criteria through neutralization, chrome reduction, metals precipitation, sulfide precipitation, or chemical oxidation. These will include wastes that are highly acidic or basic, have high levels of metals, and/or have significant levels of sulfides or cyanides. The RCRA wastes that would be amenable to treatment in the MITS are those that are hazardous by characteristic of corrosivity, reactivity and/or the TCLP (metals and organics). Wastes will be treated in batches through this unit. Incompatible wastes will be treated in separate batches. Storage or process tanks will be cleaned between processing batches of incompatible wastes.

2.3.3.5 Bin Top Solidification

Bin top solidification will be performed on loads which are predominately solid but exhibit free liquids. Free liquids are present in these loads primarily because of settling out during transport and/or adverse weather conditions. Sludge and liquid loads are not considered amenable to bin top solidification.

2.3.4 Predisposal Evaluation

The Predisposal Evaluation (PDE) process provides for prescreening of all waste prior to waste acceptance at the facility. Figure 2.3-1 details the Predisposal Evaluation Process. In order to initiate the PDE process, the waste generator or his designee must submit a sample of the waste accompanied by the following forms:

- Hazardous Waste predisposal Evaluation (PDE) Form (Exhibit 2.3-1) *Note: This form is subject to change with the regulations.
- Customer Notification and Certification (CNC) Form (Exhibit 2.3-2) *Note: This form is subject to change with the regulations.
- Chain-of-Custody Form (Exhibit 2.3-3) *Note: This form is subject to change with the regulations.

The PDE form provides initial information about volume and waste characteristics, handling procedures, generator identification and shipping information. The CNC form provides certification by the generator or the owner/operator of a treatment facility as to whether the waste is subject to the land disposal restrictions specified in 40 CFR 268 and/or California Restrictions, CCR 22. Certification that a waste is either exempt or does not require further treatment prior to land disposal will reduce the need for the LAIDLAW ENVIRONMENTAL SERVICES, LOKERN FACILITY, to test all wastes for the complete list of restricted parameters. The chain-of-custody/sampling form provides documentation from the generator

to the laboratory demonstrating a representative sample was collected by the generator and provides the sampling method.

2.3.4.1 Initiation of Testing Program and Assignment of Lab Identification Number

Samples will be collected by the waste generator or designee based on the sampling protocol in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (Third Edition, EPA SW-846). The methods and equipment used for sampling waste materials will vary with the form and consistency of waste materials to be sampled.

The sampling method chosen must be capable of obtaining a representative sample. A representative sample is defined in 22 CCR 66178 as "a sample of a universe or whole (e.g., waste pile, lagoon, ground water) which can be expected to exhibit the average properties of the universe or whole". Samples of various waste materials will be collected using protocols listed in Table 2.3-3 in order to obtain a representative sample. One function of the PDE form and the chain of custody/sampling procedures form is to document that the sample taken for analysis is a representative sample. The generator or his designee must sample his/her waste per EPA SW-846 and certify that the sample is representative of the waste.

The waste generator will generally not be requested to preserve samples prior to laboratory receipt, as the samples received at the facility laboratory must represent the waste as it would arrive at the disposal facility (i.e., the waste in the vacuum truck and/or dump truck does not come into the facility preserved). Thus, samples received for predisposal analysis at the facility, generally, will not require preservation.

Samples must be placed in proper containers for the intended analysis as specified in EPA SW-846. A consideration when choosing containers for hazardous waste samples is compatibility with the waste. Containers must not distort, rupture or leak as a result of chemical reactions with constituents of waste samples. The containers must have adequate wall thickness to withstand handling during sample collection and transport to the facility laboratory. Before a sample is accepted for analysis, the Waste Acceptance Manager or designee will:

- Examine all sample containers for damage and remove damaged sample containers from the sampling program. The generator may be contacted to submit another sample if the container is damaged.
- If necessary, confer with the Waste Acceptance Manager or designee to verify the sample container is acceptable for the required analytical program.
- Check that sample container is labeled properly. The label should contain the generator's name, date of sample collection, date of sample receipt, and laboratory sample number.
- Check that each sample is accompanied by a chain-of custody form and corresponding PDE and CNC forms. For samples to be composited, one PDE form, one CNC form and one chain-of-custody form per sampling set will be sufficient.

If a sample is deemed acceptable, the Waste Acceptance Manager or designee will determine the testing program. The generator name and waste type will be included with the testing program on a form similar to Request for Analysis (RFA) (see Exhibit 2.3-15). The sample and RFA will be forwarded to the Laboratory Manager or designee. The Laboratory Manager or designee will assign a laboratory sample ID number to the sample. The Laboratory Manager or designee will then assign analytical tasks to the various lab sections.

2.3.4.2. Sample Tracking and Storage

The facility Laboratory Manager is responsible for receiving, storing and tracking all PDE samples throughout the analysis process.

After the analysis program is defined, samples will be stored and tracked as follows:

- The Laboratory Manager will determine the appropriate preservation/storage methods taking the following into consideration:
  - Specific constituents of known interest
  - Physical state of the sample (e.g., liquid, sludge or solid)
  - Preservation/storage methods outlined in EPA SW-846
  - The length of time between receipt of the sample and subsequent analysis. (Analysis will be performed as soon as possible after receipt).

- The Laboratory Manager will track samples through the laboratory using the laboratory sample identification number. Sample splits, labeled with the laboratory sample identification number and date, will be given to the appropriate laboratory sections. The laboratory manager will keep a master list of the samples, tracking dates sent to the different laboratory sections, and dates analytical results are expected back from the laboratory sections. The Laboratory Manager will maintain communication with laboratory section leaders in order to locate and/or obtain laboratory results.

2.3.4.3. Parameter Selection and Rationale

The objective of predisposal testing of the waste is twofold: first, to generate data so that facility management can decide whether the waste is acceptable for receipt and second, to provide

the information necessary for safe, efficient and effective treatment and disposal of the waste.

All predisposal samples will be analyzed for parameters listed in Table 2.3-4. Table 2.3-4 also provides the test methods and rationale for parameter selection. The Waste Acceptance Manager or designee may select additional parameters for analysis, as listed in Table 2.3-5. The decision to perform analyses from Table 2.3-5 will be based on the physical and chemical characteristics of the waste sample submitted for evaluation and the information provided by the generator regarding the origin and composition of the waste.

Results of the predisposal analyses performed at the facility will be documented on a form similar to the Predisposal Analytical report (PDA) (Exhibit 2.3-4). The PDA report will be dated and signed by the analysts and reviewed by the Laboratory Manager or designee. All quality control data directly applicable to analytical data will be reviewed and approved by the Laboratory Manager or designee.

The results of the analyses will be reported to the Waste Acceptance Manager or designee who will review the results for waste acceptance. The Waste Acceptance Manager or designee may request additional information and/or analyses may be requested from the generator or Laboratory Manager. At a minimum, the PDE, PDA and any related forms or information will be incorporated into the facility's records management system and will be used as the basis for management decision whether to accept or reject the waste type.

2.3.4.4 Acceptance or Rejection of Wastes

The Waste Acceptance Manager or designee will follow the logic path

shown in Figure 2.3-1 to evaluate the acceptability of each waste type. This decision will be based upon the PDE and PDA as follows:

- Waste Classification Information (Item D, PDE)
  If the waste is described as a restricted waste under 40 CFR 268 Subpart C and/or 22 CCR 66900, the generator or owner/operator must complete a Customer Notification and Certification (CNC) Form (Exhibit 2.3-2). This form provides generator information required under 40 CFR 268.7(a) and treatment facility information required under 40 CFR 268.7(b), and information required by Article 40, 22 CCR. The generator is responsible for determining whether a waste is restricted from land disposal under 40 CFR 268 and 22 CCR 66900, whether the waste requires treatment to meet 40 CFR 268 and 22 CCR 66900 Subpart D standards and all applicable prohibitions set forth in 40 CFR 268.32 or RCRA Section 3004(d) or 22 CCR 66900, and whether the waste qualifies for a nationwide or statewide variance, exemption by petition, or a case by case extension. Any treatment facility sending the LAIDLAW ENVIRONMENTAL SERVICES, LOKERN FACILITY restricted wastes that have been treated to comply with the performance levels specified in 40 CFR 268 Subpart D and 22 CCR 66900 and all applicable prohibitions set forth in 40 CFR 268.32 or 22 CCR 66900 or RCRA Section 3004(d) without dilution of the prohibited waste must also submit certifications that the 40 CFR 268 and 22 CCR 66900 Subpart D treatment standards have been met. Generator's and treatment facility's waste analysis data will be attached to this form as required by regulation.

  If the PDE information indicates that the waste is restricted under 40 CFR 268 or 22 CCR 66900, a completed CNC must accompany the predisposal sample and each shipment of restricted waste. If the predisposal sample and/or each shipment of waste is not accompanied by a CNC, the sample and waste shipment will be rejected.

  If the PDE or PDA indicate the waste is subject to Land Disposal Restriction but the CNC contains a certification that the waste is exempt under 40 CFR 268.5, 40 CFR 268.6 or 22 CCR 66900, or nationwide or statewide variance or if the waste does not exceed the treatment standards listed in 40 CFR 268 Subpart D or 22 CCR 66900 or all applicable prohibitions set forth in 40 CFR 268.32 or RCRA Section 3004(d) or 22 CCR 66900, the waste stream will be accepted with no further treatment performed and without post-treatment verification analysis. If the

chemical composition as determined or the PDA exceeds the maximum allowable limits in Table 2.3-2, a bench-scale treatability test will be performed.

- Waste Description (Item F, PDE and PDA)
  The waste description will be compared with the waste types accepted (Section 2.3.2.1) and not accepted (Section 2.3.2.2) for treatment, storage or disposal at the facility. If a waste type addressed in Section 2.3.2.2 appears in Item F, the decision will be made to reject the waste.

- Physical State (Item G, PDE)
  The physical state will describe the material as a liquid, solid, semisolid (sludge) or wind dispersant, all of which may be accepted at the facility.

- pH (Item H, PDE and PDA)
  Waste materials with a pH of 2 or less or a pH of 12.5 or greater, may require additional waste verification analysis and/or special handling requirements in all phases of treatment, storage or disposal. The waste may be subject to the bench scale treatability test.

- Flash Point (Item K, PDE and PDA)
  A closed-cup flash point less than 140°F will indicate the waste material is ignitable and may warrant additional waste verification analysis and/or special handling requirements in all phases of treatment, storage or disposal. The waste may be subject to the bench scale treatability test. Note: Flashpoints will be performed on liquid wastes only, as a method for solid waste has not yet been developed.

- Chemical Composition (Item L, PDE and PDA)
  The range of constituents in the chemical composition of a waste may be used to evaluate if a treatment/stabilization bench scale test is required as described in Section 2.3.4.5.

- Metals (Item M, PDE and PDA)
  The PDE will be evaluated against the metals which are restricted pursuant to 22 CCR 66900 and 40 CFR 261.24 and 268 to determine treatment requirements. The waste may be subject to the bench scale treatability testing.

The maximum possible Toxic Characteristic (TCLP) value (in mg/l) may be determined using the total concentration of each metal and the % solids and % water (oil) being part of the solid phase.

$$\text{Maximum TCLP Value, mg/l} = \left[\frac{\text{Total concentration, mg/kg}}{\text{\%solids}} \times 100\%\right] \div \left[\frac{(\text{\%solids} \times 20) + (\text{\%liquids})}{(\text{\%solids})}\right]$$

If this calculation reveals that the EPA regulated metal could, if completely soluble under TCLP conditions, equal or exceed the EPA Hazardous level the sample will be analyzed for the TCLP concentration of that metal.

Waste incompatibilities will be determined by the Waste Acceptance Manager or designee utilizing "A Method for Determining the Compatibility of Hazardous Wastes", EPA-608/2-80-076 and Method 8503 (Exhibit 2.3-12). The incompatibility evaluation procedure is as follows:

1. Identify the specific chemicals, or classes of chemicals in the wastes.
2. Evaluate the compatibility of the identified components of the waste being disposed with the components existing in selected waste management units.
3. Decide whether a compatibility problem exists with wastes in question.
4. Accept or refuse the waste.

The following sources may be contacted regarding interpretations of 40 CFR and 22 CCR as related to the Waste Analysis Plan:

- LAIDLAW ENVIRONMENTAL SERVICES, LOKERN FACILITY environmental managers.
- LAIDLAW ENVIRONMENTAL SERVICES, LOKERN FACILITY corporate permitting and environmental project manager(s).
- DHS, RWQCB and/or EPA.

Once the Waste Acceptance Manager or designee has reviewed and evaluated the PDE, including any other pertinent generator submitted items (such as Material Safety Data Sheets (MSDS) information), the PDA, and if necessary, bench-scale treatability studies, a decision to accept or reject the waste stream will be made. If the waste stream is deemed acceptable, the Waste Acceptance Manager or designee will assign a facility waste acceptance identification number to the waste stream and will prepare the following documents:

- Waste Verification Information (WVI) form. An example of the typical format is provided in Exhibit 2.3-5. This form is an internal document which contains a summary of known information, waste sampling/handling procedures, and treatability requirements for the waste stream. The form is maintained at the facility. The WVIs are filed by waste identification numbers in the truck receiving/sampling area. The WVI will provide the following information to the waste receiving/verification facility operator:

  - Waste ID number
  - Generator name
  - Waste name and type
  - Correct sampling methods
  - Necessary waste verification tests and expected results
  - Treatability requirements
  - Unloading requirements

- Generator Notification Letter (Exhibit 2.3-6). This letter informs the generator that his/her waste is acceptable at the facility and lists the waste identification number to be utilized in the manifest with each waste shipment. The generator is also informed that the waste will have to be recharacterized should any significant changes occur in the waste stream.

2.3.4.5 Bench-Scale Treatability Testing

For wastes to be processed in the WSU or STU the analytical data on the PDE provided by the generator and on the PDA provided by the facility laboratory will be compared with the list of chemical constituents or characteristics in Table 2.3-2. If the chemical constituent or characteristic exceeds the limits described in Table 2.3-2, the waste will be treated to meet these limits prior to disposal in a landfill. To determine the required treatment, a bench-scale treatability test may include pH adjustment followed by addition of treatment/stabilizing chemicals to the waste, blending for chemical reaction, curing and post-treatment analysis to verify successful treatment.

The treated sample of waste will be analyzed to determine whether chemical constituent(s) or characteristic(s) are within the limits established in Table 2.3-2. If treatment achieves these limits, the waste type will be accepted. The results of this testing will be recorded in the record management system. In addition, the WVI will reference the treatment required.

Liquid wastes that require neutralization, metal precipitation, or other treatment in the MITS will be put through bench-scale testing that simulates the treatment steps of the MITS. The liquid will then be tested for the constituents of concern to determine if it can be treated to the required levels.

2.3.4.6 Annual Update of Predisposal Analysis

The PDA will be repeated at least annually to ensure that the waste type accurately represents the waste. The factors which may result in more frequent reevaluation of the waste type include:

- Notification from the generator of a change in the process of generation

- Discovery of a significant waste type manifest discrepancy as defined under 22 CCR 67162
- Discrepancies between incoming load verification analyses (Section 2.3.5) and the WVI.

The facility records management system will be utilized to provide lists of PDA expiration dates by generator and/or waste identification numbers. This information will be forwarded to the Waste Acceptance Manager or designee who will arrange for samples to be collected from incoming loads for reanalysis and/or contact the generator and inform of recharacterization requirements. The generator can also notify the facility that an updated sample should be taken for recharacterization analysis, due to a significant change in the waste or the waste generating process. If the annual recharacterization data reflect a significant discrepancy (e.g., toxic constituents not reported in the original PDE), then the logic path for rejecting or accepting a waste will be followed. Bench-scale treatability testing may also be performed. The generator will be notified in writing that his waste has been recharacterized and is acceptable or unacceptable. The notification will list the updated facility waste identification number. The facility waste identification number will be amended to reflect the latest recharacterization. Exhibit 2.3-7 provides an example notification sent to generators regarding waste recharacterization.

2.3.5 Verification Analysis of Incoming Waste

The goal of the Waste Verification Analysis (WVA) will be to verify that waste material delivered to the facility by the waste transporter has the same chemical and physical characteristics as the predisposal sample certified by the generator and analyzed by the facility laboratory. If the waste material's physical characteristic differs in that free liquids are present due to settling out during transport or precipitation, the Waste

Acceptance Manager or designee will investigate the load by contacting the generator and determine if the load is a candidate for bin top solidification or rejection. The logic path of the waste verification process is illustrated in Figure 2.3-2.

2.3.5.1 Review of the Manifest and Waste Identification Number

Before a load of hazardous waste will be accepted for treatment, storage, or disposal at the facility, the waste type must first be accepted through the PDE process and the waste type must be correctly identified by an internally assigned facility waste ID number. Only then will the facility accept a waste stream. Once the generator has been notified his waste is acceptable, the generator will schedule the delivery, the waste transporter will arrive at the security gate and be logged in. The driver will then proceed to the truck/sample receiving area and present the manifest and associated forms to the truck receiving staff.

Truck receiving staff will inspect the manifest for completeness and will verify that the EPA and California hazardous waste codes are consistent with the information on the WVI.

If the facility waste ID number is not on the manifest or a significant discrepancy is discovered, the generator or generator's designee will be contacted. If the significant discrepancy is resolved, it will be noted on the manifest. If not resolved, the significant discrepancy will be noted in Section 19 of the California Uniform Hazardous Waste Manifest. A letter describing unresolved discrepancies and attempts of reconciliation will be submitted to the Department of Health Services within 15 days after receipt or rejection of the waste per 22 CCR 67162(b).

Discrepancies in count (e.g., number of drums in a shipment) will be identified by visual methods. Any variation in the manifested

number of containers (drums) will constitute a significant discrepancy.

If an EPA waste code restricted from land disposal under 40 CFR 268 or 22 CCR 66900 is specified in Section I of the manifest, the manifest must be accompanied by a Customer Notification and Certification Form. If this form does not accompany the manifest, or is not properly completed by the generator or owner/operator of a treatment facility, the generator will be notified. If the generator cannot provide the CNC, the load will be rejected. The WVA will not proceed unless the referenced forms are properly executed and submitted.

When the truck receiving staff have satisfactorily reviewed the manifest for completeness, the waste sample will be tested according to the WVI. Table 2.3-6 indicates minimal waste verification parameters to be tested. Table 2.3-7 lists additional waste verification testing which may be done. A representative sample will be collected and subjected to the WVA. Results of waste analyses performed for the WVA will be recorded on the example Waste Transmittal Form (Exhibit 2.3-8).

2.3.5.2 Sampling Methods

Each incoming waste load will be sampled by qualified facility sampling personnel in order to obtain a representative sample. As an exception, for large volumes of the same waste received from one source (e.g., contaminated soil from a major remedial action), all loads will be visually inspected and at least 20 percent of the loads will be randomly selected, sampled and analyzed, according to the criteria described in Section 2.3.5.3. Additionally, loads of asbestos and other materials that cannot be safely or physically sampled and analyzed will be visually inspected.

Samples will be collected by the sampling personnel at the truck/sample receiving area based on the sampling protocol in EPA SW-846 and ASTM standards indicated on the WVI. The methods and equipment used for sampling waste materials will vary with the form and consistency of the waste materials to be sampled. Samples will be collected using the protocols listed in Table 2.3-3.

Routinely, vacuum trucks will be sampled through one of the top ports. In case of very small loads, a valve sample may be taken. An acid load with a suspected pH of less than 3 may be sampled through the bottom port of the vacuum truck.

Closed-bed trucks will be sampled through the access ports of the trailers.

The sampling of an open bed truck will be accomplished by taking a random grab and/or vertical core sample with the appropriate sampling devices identified in Table 2.3-3.

Drums will be sampled through bung and/or other sampling ports.

2.3.5.3 Parameter Selection and Rationale

The decision of what constituents to verify in the representative sample from each arriving load of hazardous waste will be based on the information provided in the PDE, the PDA history of WVA and bench-scale treatability test results. This information is summarized on the WVI form and is utilized by the truck receiving staff. The WVA will screen incoming waste loads for the parameters listed on the WVI. At a minimum, screening parameters will consist of those listed in Table 2.3-6. The Waste Acceptance Manager or designee may determine additional parameters are necessary for WVA. Additional screening parameters are listed in Table 2.3-7. In all cases, the waste verification parameters and expected results will

be listed in the WVI. The allowable ranges for the waste verification parameters are determined by the Waste Acceptance Manager or designee. These ranges are based on the PDA, generator submittal information and historical data on the waste stream and/or similar waste streams. The allowable ranges for waste verification parameters will generally be unique for each individual waste stream. In general, the complete WVA will be performed on incoming waste loads. For frequent shipments of the same waste received from one source for which a history of previous WVA results indicates consistent agreement with the WVI form, the full WVA will be performed on at least 20 percent of the loads.

2.3.5.4 Acceptance or Rejection of Incoming Waste Loads

The objective of the receiving analysis or WVA will be as follows: 1) verify that the characteristics of the incoming waste correspond with the characteristics of the predisposal sample and the manifest, 2) provide information to document that treatment is not required or that the treatment process defined in the bench-scale treatability test should be adequate to treat the waste to meet the parameters listed in Table 2.3-2, and 3) provide information for any additional bench-scale treatability testing needed for treating batch loads.

The WVA data will be compared directly with the WVI. If all chemical parameters are within the range listed on the WVI for the waste being tested, the load will be accepted for subsequent treatment and/or disposal at the facility. If the physical composition of the waste is predominately a solid, with free liquids present, bin top solidification may be used to insure proper management of the waste.

Waste loads may be rejected or subjected to further analysis if any of the following is true:

- The waste type is identified as unacceptable as defined in Section 2.3.2.2.

- Chemical composition identified by the WVA exceeds the maximum concentration range listed on the WVI form and, in the professional opinion of the Waste Acceptance Manager or designee, represents a significant discrepancy that could affect the proper treatment and disposal of the waste.

- Chemical composition identified by the WVA exceeds the limits for constituents or characteristics listed in Table 2.3-2.

- Chemical composition identified by the WVA and confirmed by bench-scale treatability test indicates that the treatment procedures defined in the PDE bench scale testing would not be sufficient to meet the limits for constituents or characteristics listed in Table 2.3-2.

- When Table 2.3-2 limits are exceeded, and not previously identified by the WVI, a bench-scale treatability test will be performed. If the material can be successfully treated, the load will be accepted. If the load cannot be treated, the load will be rejected.

For loads requiring treatment/stabilization, a decision will be made by the Waste Acceptance Manager or designee and/or the Treatment Manager or designee to either treat a load individually or batch treat a combination of loads. This decision will be made in coordination with the treatment and truck receiving staff. Wastes will be managed so that only compatible wastes and those wastes requiring comparable levels of treatment will be processed together. The compatibility of combined waste loads will be verified through the WVA. The manifest numbers of all incoming loads to be treated together will be recorded. The Waste Acceptance Manager or designee and/or the Treatment Manager or designee will determine the treatment required (e.g., pH adjustment, amount of chemical additives needed for adequate stabilization/treatment). If necessary, the Waste Acceptance Manager or designee and/or Treatment Manager or designee may direct

that a bench-scale treatability test be performed on waste loads to be combined for stabilization/treatment. The Waste Acceptance Manager or designee and/or Treatment Manager or designee will determine the proper treatment required to meet the allowable limits for parameters listed in Table 2.3-2.

2.3.6 Treatment Verification Analysis for STU and WSU

Following the treatment/stabilization of incoming waste, a treatment verification analysis (TVA) will be conducted to demonstrate that the treated material meets the allowable limits for parameters identified in Table 2.3-2. The TVA will be conducted according to the frequency described in Section 2.3.6.2. The logic path of the TVA is shown in Figure 2.3-2.

2.3.6.1 Sampling Methods

Following treatment in a mixing device at the STU or WSU, the waste should be well mixed and homogeneous. Random grab samples will be taken from the containers into which the treated waste is discharged. The samples will be collected using a clean metal trowel or shovel and placed in appropriate containers for the type of analyses to be performed per EPA SW-846. Each sample container will be labeled with a sample number, batch treatment identification number, date, time and sampler's name.

2.3.6.2 Parameter Selection and Rationale

A sample will be collected from each load of treated waste exiting the STU and will undergo the TVA unless otherwise specified in this Plan. For wastes which are required to meet the same or similar treatment standards prior to land disposal, the TVA will be performed on samples collected from a minimum of 10% of the treated waste loads exiting the STU. The remaining samples will be archived for possible future analysis, if necessary. Within this framework, TVA will be performed as follows:

- Where the WVA indicates the untreated waste meets Table 2.3-2 parameters, but fails the paint filter test, the treated waste will be subjected to the paint filter test to verify no free liquids are present.

- Where the WVA or generator's/treatment facility's data indicates the untreated waste requires treatment under the Land Disposal Restrictions, the Toxicity Characteristic Leaching Procedure (TCLP) or equivalent method will be used to evaluate the results with the limits in Table 2.3-2 or 40 CFR 268 Subpart D. It is anticipated that an alternate leaching procedure will be developed by the facility to reduce the significant time requirement to perform the TCLP. As experience with the TCLP, the treatment process, and individual waste streams is accumulated, LAIDLAW ENVIRONMENTAL SERVICES, LOKERN FACILITY will petition the Department for approval of an alternate treatment verification method. Time allocated for TVA will be a major element affecting performance of waste treatment and disposal in a timely manner.

- Where untreated waste contains dissolved metal or cyanide concentrations in the liquid phase restricted by 22 CCR 66900 and 40 CFR 268, the TVA will consist of the paint filter test to demonstrate that there is no liquid phase subject to the restriction.

- Where untreated waste is cyanide or sulfide reactive, a sample of the treated waste will be collected and subjected to analysis for cyanide or sulfide reactivity.

- Where incoming waste is an ignitable liquid, a sample of the treated waste will be collected and subjected to the

paint filter test to demonstrate there is no liquid phase.

- Where untreated waste contains parameters that exceed any of the Table 2.3-2 allowable limits, the treated waste will be subject to analysis of all parameters exceeding the limits listed in Table 2.3-2.

- Additional testing of the treated waste will be performed or indicated testing modified as necessary to conform with future regulatory criteria.

Only after the TVA confirms that treatment performance standards are met will waste material undergo final placement in a landfill. If the TVA indicates the performance standards are not met for a load of treated waste, the archived samples of all treated waste loads placed in the landfill subsequent to this waste type's previous TVA will also undergo the TVA. Based on the analysis of these archived treated waste samples, any load of treated waste determined to not meet the treatment performance standards will undergo additional stabilization/treatment, after removal from the landfill. A second TVA will be performed on each load of treated waste produced from such retreatment. If the treatment standards are not met, the waste may undergo additional treatment, with a follow-up TVA. If continued reprocessing is not feasible, the waste will be manifested and shipped off-site for alternate treatment or disposal according to all applicable regulations.

2.3.7 Treatment Verification Analysis for MITS

Following treatment of a waste stream in the MITS, the liquid will be transferred to one of the treated liquid tanks. The waste will be held in the tank while a treatment verification analysis TVA is performed. The TVA will demonstrate that the treatment process was

completed and that the treated material no longer meets the criteria for a hazardous waste under Article 11 of 22 CCR or a restricted waste as in CFR 40, Part 268.

2.3.7.1 Sampling Methods

The treated waste is sampled after placement in a treated liquid tank. The tank will be sampled according to the guidelines in EPA SW-846 for collecting a representative sample. The samples will be collected from side ports on the tank and at the top of the tank and placed in appropriate containers. Each sample container will be labeled with a sample number, batch treatment identification number, date, time and sampler's name.

2.3.7.2 Parameter Selection and Rationale

The particular TVA to be run on a batch of waste processed through the MITS will be determined by the Waste Acceptance Manager or designee and/or Treatment Manager or designee. The choice of parameters will be based on the characteristics or constituents which caused the waste to be classified as hazardous. If the waste was hazardous due to the characteristic of corrosivity (high or low pH) only, the treated liquid will be analyzed for pH. If the waste was hazardous due to the concentration of one or more metals, then the treated liquid will be tested for those metals. Likewise, if the waste was hazardous due to the concentrations of cyanide or sulfide, then the treated waste will be tested for cyanide or sulfide reactivity. If a waste is hazardous due to more than one constituent, all parameters of concern will be analyzed.

All analyses will be performed according to methods included in EPA SW-846, "Standard Methods for the Examination of Water and Wastewater", and LAIDLAW ENVIRONMENTAL SERVICES, LOKERN FACILITY methods included in Exhibit 2.3-12. Only after the TVA confirms

that the MITS treatment process is complete will the liquid in the treated liquid tank be transferred to a nonhazardous surface impoundment. If the TVA indicates that treatment of the waste was not complete, the waste will be treated again in the MITS and subjected to a second TVA. If continued retreatment is not feasible, the waste will be manifested and shipped offsite for alternate treatment according to all applicable regulations.

2.3.8 Solidification Verification Analysis for Bin Top Stabilization

Following the addition of solidification agents to an incoming waste load, a solidification verification analysis will be conducted to demonstrate the waste material passes the paint filter test.

2.3.8.1 Sampling Methods

The solidified waste is sampled after the addition of the solidification agents. Random grab samples will be taken from the waste loan according to the guidelines in EPA SW-846 for collecting a representative sample.

2.3.8.2 Parameter Selection & Rationale

The solidified waste samples will be subjected to the paint filter test only to verify no free liquids are present. If free liquids are present, the Waste Acceptance Manager will evaluate the feasibility of bin top solidification.

2.3.9 Quality Assurance/Quality Control

Both sampling and analytical techniques are subject to quality assurance/quality control (QA/QC) procedures. Sampling procedures are discussed in Sections 2.3.4.1 and 2.3.5.2 and the test methods for parameters are included in Tables 2.3-4, 2.3-5, 2.3-6 and 2.3-7.

Representative waste samples will be obtained using methods and equipment appropriate to the physical and chemical properties of the waste. The selection and use of sampling equipment will be done only by qualified personnel. Except for large shipments of homogeneous wastes from a single source, every waste load will be sampled.

Sampling equipment and containers will be constructed of materials compatible with the wastes. Care will be taken during sampling to prevent contamination of the samples. All containers for samples of incoming waste will be identified with labels that contain the laboratory sample identification number and date. Sample containers for WVA will be labeled with the waste identification number or batch treatment identification number (as appropriate), date, time and sampler's name. A completed PDE form, CNC form and chain-of-custody form will accompany the predisposal sample to the facility, where the Waste Acceptance Manager or designee will define the plan for analysis. Sample analyses will generally be performed within 72 hours for predisposal analyses and immediately for waste verification analyses.

Records and results of waste analyses performed for the PDA will be maintained for each waste type by a facility assigned waste identification number. The analyses will be cross referenced by generator name using the data management system. Records and results of waste analyses performed for WVA will be recorded on the example Waste Transmittal Form (WTF) included as Exhibit 2.3-8 and filed with each manifest in chronological order.

The LAIDLAW ENVIRONMENTAL SERVICES, LOKERN FACILITY Quality Assurance Manual, which is available on site for inspection, provides information and procedures in the following areas:

- Calibration
- Preventive Maintenance
- Analytical Procedures
- Data Verification
- Records Management
- Quality Assurance/Quality Control Audits
- Quality Control Samples
- Sample Receipt

The facility laboratory utilizes standard laboratory practices, including the analysis of quality control samples, data verification, nonconformance and corrective measures, preventive maintenance, record keeping practices, and general laboratory protocols as outlined in detail in the LAIDLAW ENVIRONMENTAL SERVICES, LOKERN FACILITY Quality Assurance Manual.

All records of calibration will be maintained on the following forms as prescribed by the Quality Assurance Manual. Examples of these forms are as follows:

- AA Data Sheet (Exhibit 2.3-16)
- ICP Data Sheet (Exhibit 2.3-9)
- GC Data Sheets (Exhibit 2.3-10)
- pH Calibration Log (Exhibit 2.3-11)

2.3.10 Records Management System

A written operating record as required by 22 CCR 67163 will be recorded as it becomes available and will be maintained at the site until final closure. The operating record will include:

- A description and the quantity of each hazardous waste received and the method(s) and date(s) of its treatment, storage and disposal will be recorded on the California Waste Manifest as amended May 1, 1987 (and subsequent revisions), and filed in chronological order (by date).

- The final location of each treated batch placed in a landfill will be recorded on the Waste Transmittal form (Exhibit 2.3-8). The location and quantity of each hazardous waste in a landfill will be cross referenced to specific manifests.

- Records and results of waste analyses performed for the PDE will be maintained for each waste type by waste identification number. The analytical results will be cross referenced by generator name using the data management system. Records and results of waste analysis performed for the WVA will be recorded on the Waste Transmittal form and filed with each manifest, in chronological order (by date).

- Post-treatment verification records will be maintained in Records Management System.

- All records applicable to the facility laboratory will be maintained in accordance with the Quality Assurance Manual.

- The CNC form regarding the Land Disposal.

  Restrictions (40 CFR Part 268 and 22 CCR 66900) will be maintained and attached to the PDE and filed by generator name and waste identification number.

- A copy of any manifest discrepancy letter describing the discrepancy and attempts to reconcile it, with a copy of the manifest or shipping paper(s) at issue, that is filed with the Department within 15 days of rejecting the waste per 22 CAC 67162(b) will be placed in the Records Management System.

All records required to be retained by law, regulation, or the final facility permit conditions will be furnished upon request and made available at all reasonable times for inspection by any officer, employee, or delegated representative of the DHS.

TABLE 2.3-1
HISTORICALLY ACCEPTABLE WASTES, ASSOCIATED HAZARDS, AND BASIS FOR HAZARD DESIGNATION
LOKERN FACILITY

WASTE DESCRIPTION	EPA HAZARDOUS WASTE NUMBER(a)	CALIFORNIA HAZARDOUS WASTE CODE(b)	BASIS FOR HAZARDOUS DESIGNATION(a)	CHEMICAL PROPERTIES	PHYSICAL PROPERTIES
Contaminated soil	(c)	611	Toxic, corrosive	pH 5 to 12.5	100% Solid
Spent refinery catalyst	(c)	162	Toxic	pH 6.5, Ni, Al	100% Solid
Jet fuel contaminated foam	(c)	181	Toxic	Hydrocarbon Concentration	100% Solid
Sulfur cake/sulfur sludge	(c)	441	Toxic	V 0-1%, S 99-100%	50-100% Solid
Drilling muds and cuttings	(c)	521	Toxic	pH 6 to 12.5, oil, metals	10-100% Solid,
Lead tank bottoms	K052	241	Listed refinery waste, toxic	pH 6 to 11, Pb	40% Solid
Slop oil emulsion solids	K049	491	Listed refinery waste, toxic	May be ignitable, pH 5 to 10, Cr, Pb	40% Solid
Heat exchange bundle cleaning sludge	K050	491	Listed refinery waste, toxic	pH 6 to 9, Cr, metals	80% Solid
API Separator sludge	K051	222	Listed refinery waste, toxic	May be ignitable, pH 3 to 10, metals/Cr	10% Solid
Reactive waste/sulfide and cyanide bearing	D002	Various, 131	Reactivity	pH 5 to 12, sulfide, cyanide	5-10% Solid,
Produced water	(c)	135	Toxic	pH 3 to 11, hydrocarbons/oil	20% Solid,
Oil/oily waste	(c)	223	Ignitability, toxic	pH 6 to 9, flashpoint <140°F, oil	20-50% Solid,
Water softener waste water	(c)	135	Toxic	pH 6 to 11, heavy metals, such as Cr	20-40% Solid,
Well wash water	(c)	135	Toxic, ignitable	May have flashpoint <140°F, pH 6 to 9; oil	10-20% Solid,
Spent acids	(c)	134	Corrosive	pH 2.1 to 5; fluoride, HCl, HF, H_2SO_4	10-20% Solid,

TABLE 2.3–1
(Continued)

WASTE DESCRIPTION	EPA HAZARD WASTE NUMBER(a)	CALIFORNIA HAZARD WASTE CODE	BASIS FOR HAZARDOUS DESIGNATION(a)	CHEMICAL PROPERTIES	PHYSICAL PROPERTIES
Spent caustics	(c)	134	Corrosive	pH 8 to 12	10–40% Solids
Soda ash	(c)	134	Corrosive	pH 9 to 12	100% Solids
Spent filter media	(c)	223	Toxic, ignitable	pH 6 to 10, hydrocarbons, Zn, Ni, Pb, flashpoint may be <140 deg F	50–90% Solids
Fly ash	(c)	571	Toxic	pH 8 to 12, Nickel, Vanadium	40–100% Solids
Asbestos insulation	(c)	151	Toxic	Inhalation hazard	100% Solids
Cooling tower blowdown and sludge	D007 and/or (c)	491	Toxic	pH 5 to 10, Chromium	10–80% Solids
Coke	(c)	223	Toxic	pH 6 to 9; oil	100% Solids
Refractory liner	(c)	181	Toxic	pH 6 to 10 Ni, As, Pb, Se, V, Zn	100% Solids
Refinery maintenance waste	D004, D005, D006, D007, D008, D009, D010, D011	491 (can vary)	Toxic	pH 3 to 12, may have conc of As, Ba, Cd, Cr, Pb, Hg, Ni, Se, V, Zn; oil	20–100% Solids (Varies)
Leachate	F039		Toxic	pH 2.5 to 12.0; may have conc of As, Ba, Cd, Cr, Pb, Hg, Ni, Se, V, Zn	80–99% Liquids

(a) 40 CFR 261.20 through 261.24
(b) Department of Health Services Waste Manifest Reporting Requirements, 1986.
(c) No corresponding EPA Hazardous Waste Number

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TABLE 2.3-2
CRITERIA FOR REJECTION OF WASTES FROM LANDFILL DISPOSAL
LAIDLAW ENVIRONMENTAL SERVICES, LOKERN FACILITY

CONSTITUENT/CHARACTERISTIC	MAXIMUM ALLOWABLE LIMITS
Organic Lead	100 ppm
Free liquids	--
Reactivity (Cyanide/Sulfide)	Sulfide-500 mg/kg(a) Cyanide-250 mg/kg(a)
Dissolved Cyanides (liquids only)	1,000 mg/l(b)
Ignitability	Flashpoint $\geq$140°F
Halogenated organic compounds	1,000 mg/kg
pH (liquids only)	2.0 < Ph < 12.5(c)
Polychlorinated biphenyls (PCBs)	$\leq$ 50 mg/kg

Intact containers will not be accepted in any of the landfills. All containers must be crushed prior to landfill acceptance.

(a) As per interim guidelines for reactivity, Section 7.3, SW-846, 3rd Edition.
(b) Material is tested for dissolved concentrations.
(c) A 1:1 mixture of waste sample to water is made and pH taken.
(d) Toxicity Characteristic Leaching Procedure (TCLP) extract concentration. TCLP is described in Appendix I to 40 CFR 268.

NOTE: This table incorporates by reference future treatment standards that may be promulgated under 40 CFR 268, Subpart D.

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TABLE 2.3-2 (continued)
CRITERIA FOR REJECTION OF WASTES FROM LANDFILL DISPOSAL
LAIDLAW ENVIRONMENTAL SERVICES, LOKERN FACILITY

Liquid waste containing dissolved metals of concentration equal to or greater than those listed below are considered restricted in California (66900) and must meet applicable treatment standards as developed by the State of California.

LIQUID WASTE	DISSOLVED CONCENTRATION
Arsenic and/or compounds in free liquid as As	500 mg/l(b)
Cadmium and/or compounds in free liquid as Cd	100 mg/l(b)
Chromium (VI) or compounds in free liquid as Cr (VI)	500 mg/l(b)
Lead and/or lead compounds in free liquid as Pb	500 mg/l(b)
Mercury and/or compounds in free liquid as Hg	20 mg/l(b)
Nickel and/or compounds in free liquid as Ni	134 mg/l(b)
Selenium and/or compounds in free liquid as Se	100 mg/l(b)
Thallium and/or compounds in free liquid as Tl	130 mg/l(b)

Intact containers will not be accepted in any of the landfills. All containers must be crushed prior to landfill acceptance.

(a) As per interim guidelines for reactivity, Section 7.3, SW-846, 3rd Edition.
(b) Material is tested for dissolved concentrations.
(c) A 1:1 mixture of waste sample to water is made and pH taken.
(d) Toxicity Characteristic Leaching Procedure (TCLP) extract concentration. TCLP is described in Appendix I to 40 CFR 268.

NOTE: This table incorporates by reference future treatment standards that may be promulgated under 40 CFR 268, Subpart D.

TABLE 2.3-2
(Continued)

Wastes containing TC (Toxicity Characteristics Leaching PRocedure) levels listed below are considered RCRA restricted wastes and must be treated to applicable treatment standards which are to be developed by EPA. These wastes may continue to be accepted under applicable variances.

Toxicity Characteristics Constituents and Regulatory Levels

EPA HW Number (1)	Constituent	CAS Number (2)	Regulatory level (mg/L)
D004	Arsenic	7440-36-2	5.000
D005	Barium	7440-39-3	100.000
D018	Benzene	71-43-2	0.500
D006	Cadmium	7440-43-9	1.000
D019	Carbon tetrachloride	56-23-5	0.500
D020	Chlordane	57-74-9	0.030
D021	Chlorobenzene	108-90-7	100.000
D022	Chloroform	67-66-3	6.000
D007	Chromium	7440-47-3	5.000
D023	o-Cresol	95-48-7	200.000(4)
D024	M-Cresol	106-39-4	200.000(4)
D025	P-Cresol	106-44-5	200.000(4)
D026	Cresol		200.000(4)
D016	2,4-D	94-75-7	10.000
D027	1,4-Dichlorobenzene	106-46-7	7.500
D028	1,2-Dichloroethane	107-06-2	0.500
D029	1,1-Dichloroethylene	73-35-4	0.700
D030	2,4-Dinitrotoluene	121-14-2	0.130(3)
D012	Endrin	72-20-8	0.020
D031	Heptachlor (and its hydroxide)	76-44-8	0.008
D032	Hexachlorobenzene	118-74-1	0.130(3)
D033	Hexachloro-1,3-butadiene	87-68-3	0.500
D034	Hexachloroethane	67-72-1	3.000
D008	Lead	7439-92-1	5.000
D013	Lindane	58-89-9	0.400
D009	Mercury	7439-97-6	0.200
D014	Methoxychlor	72-43-5	10.000
D035	Methyl ethyl ketone	78-93-3	200.000
D036	Nitrobenzene	98-85-3	2.000
D037	Pentachlorophenol	87-86-5	100.000
D038	Pyridine	110-86-1	5.000(3)
D010	Selenium	7782-49-2	1.000
D011	Silver	7440-22-4	5.000
D039	Tetrachloroethylene	127-18-4	0.700

TABLE 2.3-2
(Continued)

EPA HW Number (1)	Constituent	CAS Number (2)	Regulatory level (mg/L)
D015	Toxaphene	8001-35-2	0.500
D040	Trichloroethylene	79-01-6	0.500
D041	2,4,5-Trichlorophenol	95-95-4	400.000
D042	2,4,6-Trichlorophenol	88-06-2	2.000
D017	2,4,5-TP(Silvex)	93-72-1	1.000
D043	Vinyl chloride	75-01-4	0.200

(1) Hazardous waste number.
(2) Chemical abstracts service number.
(3) Quantitation limit is greater than the calculated regulatory level. The quantitation limit therefore becomes the regulatory level.
(4) If o, m, and p-cresol concentrations cannot be differentiated, the total cresol (D026) concentration is used. The regulatory level for total cresol is 200 mg/L.

TABLE 2.3-2, Continued
SOLVENTS REGULATED BY THE LAND DISPOSAL
RESTRICTIONS AND THEIR TREATMENT STANDARDS

F001-F005 spent solvents	Spent solvent concentration in TCLP extract: Wastewaters containing spent solvents 1 (mg/L)	All other spent solvent wastes 2 (mg/L)	P- and U-list solvents: Hazardous waste number	Third listing
Acetone	0.05	0.59	U002	2nd
n-Butyl alcohol	5.0	5.0	U031	1st
Carbon disulfide	1.05	4.81	P022	3rd
*Carbon tetrachloride	0.05	0.96	U211	1st
*Chlorobenzene	0.15	0.05	U037	1st
*Cresols (and cresylic acid)	2.82	0.75	U052	3rd
Cyclohexanone	0.125	0.75	U057	2nd
*1,2-Dichlorobenzene	0.65	0.125	U070	2nd
Ethyl acetate	0.05	0.75	U112	3rd
Ethyl benzene	0.05	0.053	----	---
Ethyl ether	0.05	0.75	U117	3rd
*Isobutanol	5.0	5.0	U140	2nd
Methanol	0.25	0.75	U154	1st
*Methylene chloride	0.20	0.96	U080	2nd
*Methylene chloride (from the pharmaceutical industry) 4	0.44	----	U080	2nd
*Methyl ethyl ketone	0.05	0.75	U159	1st
Methyl isobutyl ketone	0.05	0.33	U161	2nd
*Nitrobenzene	0.66	0.125	U169	2nd
*Pyridine	1.12	0.33	U196	2nd
*Tetrachloroethylene	0.079	0.05	U210	1st
*Toluene	1.12	0.33	U220	1st
*1,1,1-Trichloroethane	1.05	0.41	U226	1st
*1,1,2-Trichloro-1,2,2-trifluoroethane	1.05	0.96	---	---
*Trichloroethylene	0.062	0.091	U228	1st
*Trichlorofluoromethane	0.05	0.96	U121	3rd
Xylene	0.05	0.15	U239	2nd

*F001, F002, F004, or F005 wastes.

1 Contains either: <1.0% total organic carbon, or <1.0% total F001-F005 solvents listed in this table. The effective date for these wastes is November 8, 1988.

2 The effective date for these wastes is November 8, 1986.

3 Corresponds to listing in 268.10, 268.11, or 268.12, respectively.

4 Treatment standard based on concentration in wastewater, not TCLP extract; only wastewater treatment standards have been established for this waste subcategory.

Source: McCoy and Associates, Inc., adapted for 40 CFR 268.10-.12, 268.41, and 268.43.

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TABLE 2.3-3
METHODS AND EQUIPMENT USED TO COLLECT REPRESENTATIVE SAMPLES OF WASTE

WASTE MATERIAL	METHOD	EQUIPMENT
Containerized liquids	SW-846	Coliwasa, tubing, weighted bottle
Extremely viscous liquid	ASTM Standard D140-70	Tubing or thief
Crushed or powdered material	ASTM Standard D346-75	Tubing, trier, scoop or shovel
Soil or rock-like material	ASTM Standard D420-69	Tubing, trier, auger, scoop or shovel
Soil-like material	ASTM Standard	Tubing, trier, shovel
Fly ash-like material	ASTM Standard D2234-76	Tubing, trier, auger, scoop or shovel

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TABLE 2.3-4
PARAMETERS, TEST METHODS AND RATIONALE FOR SELECTION
APPLICABLE TO ALL PREDISPOSAL WASTE SAMPLES
LAIDLAW ENVIRONMENTAL SERVICES, LOKERN FACILITY

PARAMETER	METHOD(a)	DETECTION LIMIT	VARIANCE OF ANALYTICAL METHOD	RATIONALE
Compatibility, Reactivity	Method 8503	N/A	N/A	Determine the compatibility and reactivity before storage and treatment.
Cyanide, Screen	Method 9	10 ppm	N/A	Determine presence or absence of cyanide, a potentially reactive substance. Waste Characterization.
pH	EPA 9040	N/A	±0.5%	Identify restricted corrosive waste. Waste characterization. Determine if pH adjustment is necessary.
Physical Description	N/A	N/A	N/A	Determine the general physical characteristics, such as physical state, color, odor, number of phases, and visible free liquids. Used to compare initial waste sample with subsequent incoming loads.
Flashpoint	EPA1010	N/A	±2°F	Check for ignitability to determine safe handling of material.
Sulfide Screen	Method 8	10 ppm	N/A	Determine presence or absence of potentially reactive substance. Waste characterization.

TABLE 2.3-4
(Continued)

a) Test method references are as follows:
EPA - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", EPA SW-846, Third Edition
ASTM - ASTM Standard Test Methods
Method - Exhibit 2.3-12/Method - Exhibit 2.3-12

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TABLE 2.3-5
ADDITIONAL PARAMETER, TEST METHODS AND RATIONALE FOR SELECTION APPLICABLE TO SELECTED PREDISPOSAL WASTE SAMPLES LAIDLAW ENVIRONMENTAL SERVICES, LOKERN FACILITY

PARAMETER	METHOD(a)	TYPICAL DETECTION LIMITS	VARIANCE OF ANALYTICAL METHOD	RATIONALE
Acidity	SM 402	N/A	±0.05	Waste characterization Identify potentially corrosive material.
Alkalinity	SM 403	N/A	±0.05	Waste characterization Identify potentially corrosive material.
Centrifugation of waste	Method 8105	N/A	N/A	Determine phase distribution (% oil, % solids, % water)
Free Liquids	EPA 9095	N/A	N/A	Identification of free liquid per land disposal restriction. Compliance with RCRA. Determination of waste handling.
Excess Oxidant	SM 412	N/A	N/A	Identification of possible hazard with incompatible material during waste storage and treatment.
Chromium (VI)	EPA 7195 or 7196	5 ppm	±10%	Determination of species of metal. Restricted metal per 22 CAC 66900. Waste characterization.
Solvent Distillation	ASTM D86	N/A	N/A	For waste material containing an oil layer, distillation will fractionate the oil layer for solvent identification. Waste characterization may affect treatment process.

TABLE 2.3-5
(Continued)

PARAMETER	METHOD(a)	TYPICAL DETECTION LIMIT	VARIANCE OF ANALYTICAL METHOD	RATIONALE
Specific Gravity	ASTM	N/A	N/A	Waste characterization
GC Scan: Halogenated Volatile Organic	EPA 8010	25 mg/kg	±15%	For wastes containing an organic layer, identification of CA restricted and federal land disposal restricted waste. Waste characterization may affect treatment process.
TOX	EPA 9020	20 ppm	±20%	Waste characterization
PCB	EPA 8080	1 mg/kg	±20%	Waste characterization
Non-Halogenated Organics	EPA 8020	1 mg/kg	±20%	Waste characterization
F001-F005 Constituents	TCLP Appendix I 40 CFR 268	0.05	±10%	Treatment impoundment land disposal restriction.
Toxicity Characteristic Leaching Procedure	40 CFR 268 Appendix 1	0.05	±10%	Treatment land disposal restriction.
Heating Values	ASTM D 240	N/A	N/A	Waste Characterization
Total Organic Lead	DHS	5 ppm	±20%	Determination of waste discharge requirement restriction.

TABLE 2.3-5
(Continued)

PARAMETER	METHOD(a)	LIMIT	METHOD	RATIONALE
Total Petroleum Hydrocarbons	ASTM 418.0	50 ppm	±10%	Provides indication of the extent of petroleum contamination. Also provides an indication of the expected hydrocarbon vapor pressure on the waste stream for the waste verification procedures. This parameter is used for characterization purposes.
Ammonia	SM 417	25 ppm	±20%	Waste characterization
Total Sulfide	SM 427	10 ppm	±10%	Waste characterization
Total Cyanide	SM 412	10 ppm	±10%	Waste characterization
Total Metals:				
Arsenic	EPA 7060 or 7061	10 ppm	±20%	Waste characterization
Barium	EPA 7080	25 ppm	±20%	Waste characterization
Beryllium	EPA 7090	2.0 ppm	±20%	Waste characterization
Cadmium	EPA 7130	2.5 ppm	±20%	Waste characterization
Chromium	EPA 7190	10 ppm	±20%	Waste characterization
Cobalt	EPA 7210	5 ppm	±20%	Waste characterization
Lead	EPA 7420	10 ppm	±20%	Waste characterization
Mercury	EPA 7470 or 7471	0.2 ppm	±20%	Waste characterization
Nickel	EPA 7520	10 ppm	±20%	Waste characterization
Selenium	EPA 7740 or 7741	5.0 ppm	±20%	Waste characterization
Thallium	EPA 7840	10 ppm	±20%	Waste characterization
Vanadium	EPA 7910	25 ppm	±20%	Waste characterization
Zinc	EPA 7950	5 ppm	±20%	Waste characterization

TABLE 2.3-5
(Continued)

a) Test method references are as follows:
SM - Standard Methods for the Examination of Water and Wastewater, 16th Edition, 1985.
EPA - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", EPA SW-846, 3rd Edition.
ASTM - ASTM Standard Test Methods
Methods - Exhibit 2.3-12.
DHS -- Method developed by DHS.
TCLP - Toxicity Characteristic Leachate Procedure, 40 CFR 268.
N/A - Not Available

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TABLE 2.3-6
PARAMETERS, TEST METHODS AND RATIONALE FOR SELECTION
APPLICABLE TO ALL WASTE VERIFICATION SAMPLES
LAIDLAW ENVIRONMENTAL SERVICES, LOKERN FACILITY

PARAMETER	METHOD(a)	DETECTION LIMIT	VARIANCE OF ANALYTICAL METHOD	RATIONALE
pH	EPA 9040	N/A	±0.2	Waste verification. Identify restrictive waste. Determine if pH adjustment is necessary.
Physical Description	N/A	N/A	N/A	Waste verification. Subjective comparison with original sample of waste.
Sulfide Screen	Method 8	10 ppm	N/A	Waste verification. Determine the presence of sulfide, a potentially reactive compound.
Reactive Cyanide	Method 9	10 ppm	N/A	Waste verification. Determine the presence of cyanide, a potentially reactive compound.

a) Test method references are as follows:
EPA - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", EPA SW-846, 3rd Edition
Method - Exhibit 2.3-12.
ASTM - ASTM Standard Test Methods
N/A - Not Available

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TABLE 2.3-7
PARAMETERS, TEST METHODS AND RATIONALE FOR SELECTION APPLICABLE TO SELECTED WASTE VERIFICATION SAMPLES LAIDLAW ENVIRONMENTAL SERVICES, LOKERN FACILITY

PARAMETER	METHOD(a)	TYPICAL DETECTION LIMIT	VARIANCE OF ANALYTICAL METHOD	RATIONALE
Free Liquids	EPA 9095	N/A	N/A	Waste verification. Identification of free liquid for land disposal restrictions. Determination of waste handling and post-treatment verification
Hydro-carbon Vapor Pressure (HCVP)	Method 22	N/A	N/A	Screening method to check for ignitability Determine safe handling of the material. (NOTE - If HCVP indicates ignitability, additional screening may be done utilizing PMCC closed cup flashpoint - additional verification parameters Table 2.3-7
Centrigu-ation of Waste	Method 8105	N/A	N/A	Waste verification.
Fluoride	SM 414	20 ppm	±15%	Waste verification.
Specific Gravity	ASTM D 1429	N/A	N/A	Waste and volume verification.
Flashpoint (Pensky Martin Closed Cap)	EPA 1010	N/A	±2°F	Waste verification. To be done on all liquid waste verification samples with HCVP >300 PPM in order to determine ignitability.
Compati-bility	Method 8503	N/A	N/A	Waste verification and post-treatment verification.

TABLE 2.3-7
(Continued)

PARAMETER	METHOD(a)	TYPICAL DETECTION LIMIT	VARIANCE OF ANALYTICAL METHOD	RATIONALE
Chromium	EPA 7196	5 ppm	±10%	Waste verification and post-treatment verification.
Metals (Aqueous Phase)(b)				
Arsenic	EPA 7060 or 7061	10 ppm	±10%	May be used as waste verification. Identification of CA restricted and federal land disposal restricted waste. Also post-treatment verification may affect treatment process.
Cadmium	EPA 7130	10 ppm	±10%	
Chromium	EPA 7190	10 ppm	±10%	
Lead	EPA 7420	10 ppm	±10%	
Mercury	EPA 7470	10 ppm	±10%	
Nickel	EPA 7520	10 ppm	±10%	
Selenium	EPA 7740	10 ppm	±10%	
Thallium	EPA 7840	10 ppm	±10%	
Ammonia	SM 417	25 ppm	±20%	Waste verification.
GC Scan: Halogenated Volatile Organics	EPA 8010	25 mg/kg	±15%	May be used as waste verification. For wastes containing an organic layer, identification of CA restricted and federal land disposal restricted waste. Also post-treatment verification may affect treatment process.
PCB	EPA 8080	1 mg/kg	±20%	Waste verification.
Non-Halogenated Organics	EPA 8020	1 mg/kg	±20%	Waste verification.
F001-F005 Constituents	TCLP Appendix I 40 CFR 268	0.05	±10%	Post-treatment verification for restricted wastes.
Total Organic Lead	DHS	5 ppm	±20%	Waste verification and post-treatment verification.

TABLE 2.3-7
(Continued)

PARAMETER	METHOD(a)	TYPICAL DETECTION LIMIT	VARIANCE OF ANALYTICAL METHOD	RATIONALE
Total Petroleum Hydrocarbons	ASTM 418.0	50 ppm	±10%	Waste verification.
Excess Oxidant	SM 412	N/A	N/A	Waste verification.
Heating Values	ASTM D 240	N/A	N/A	Waste verification.
Organo-Phosphates	EPA 608/ 8140	1-150 ppm	±10%	Waste characterization for wastes thought to contain pesticide and/or herbicide.
Triazines	EPA 619	1-50 ppm	±10%	Waste characterization for wastes thought to contain pesticide and/or herbicide.
Chlorinated Herbicides (Phenoxy, Phenolics)	EPA 615/ 8150	1-50 ppm	±10%	Waste characterization for wastes thought to contain pesticide and/or herbicide.
Carbonates	EPA 632	1-50 ppm	N/A	Waste characterization for wastes thought to contain pesticide and/or herbicide.

a) Test method references are as follows:
SM - Standard Methods for the Examination of Water and Wastewater, 16th Edition, 1985.
EPA - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", EPA SW-846, 3rd Edition.
ASTM - ASTM Standard Test Methods
Method - Exhibit 2.3-12
Method - Exhibit 2.3-12
DHS - Method developed by DHS

TABLE 2.3-7
(Continued)

TCLP - Toxicity Characteristic Leachate Procedure, 40 CFR 268.

b) Alternative analytical methods to include EPA 6010, Inductively Coupled Plasma Emission Spectrometry.

N/A - Not Available

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EXHIBIT 2.3-1

HAZARDOUS WASTE PREDISPOSAL EVALUATION FORM (PDE)

(DRAFT)

DRAFT

Date: September 27, 1990
Revision No. 5

EXHIBIT 2.3-1
HAZARDOUS WASTE PREDISPOSAL EVALUATION

The Hazardous Waste Predisposal Evaluation Form is designed to obtain crucial information to assist LAIDLAW ENVIRONMENTAL SERVICES, LOKERN FACILITY, in the safe, legal and economical handling of samples and bulk/containerized wastes. Providing all known information about each of your wastes will help to ensure that all necessary analyses are completed in a timely manner and that adequate information is then available for proper waste management decisions.

Customer service administrators are available through LAIDLAW ENVIRONMENTAL SERVICES, LOKERN FACILITY sales offices and should be contacted with any questions relating to the completion of this form, sample processing and waste acceptability.

GENERAL INSTRUCTIONS

1. A separate evaluation form must be submitted for each waste stream.

2. A representative sample of waste in a proper container, per the standards of EPA SW-846, should be submitted with each evaluation form and labeled with the Generator Name, Waste Description, Hazardous Characteristics, Date and Evaluation # from the top right corner of this form.

3. After completing the Evaluation form, retain the goldenrod copy for your records. Refer to the evaluation number in Section A in all correspondence about your waste material.

4. All items on this form must be completed to the best of the generator's ability. The following responses are acceptable using the noted abbreviations:

N/A - Not Acceptable	Susp - Suspected
Unk - Unknown	Est - Estimated

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PLEASE NOTE THAT SOME INCOMPLETE RESPONSES MAY DELAY SAMPLE PROCESSING IF ADDITIONAL INFORMATION IS NECESSARY OR REQUESTED BY LAIDLAW ENVIRONMENTAL SERVICES, LOKERN FACILITY LABORATORY OR OPERATIONS PERSONNEL.

EXHIBIT 2.3-1

GSX MATERIAL PROFILE

Name of Waste Stream

GSX Use Only

Sample # _____ Date Rec'd _____
Waste Stream# _____
Acct Mgr _____ Date Submitted _____
Analytical Charges _____
PO/Contract # _____
Billing Instructions _____

Generator _____
Facility Address _____
City _____
State _____ Zip Code _____
EPA ID # _____ BOE Tax # _____

Technical Contact _____
Title _____
Telephone ( ) _____ EXT. _____
Billing Address _____
_____
City _____ State _____ Zip _____

Process Generating Waste _____
Rate of Generation _____ Container Type/Size _____

1. Does this waste contain spent solvents (F001 through F005)? Y _____ N _____ Materials listed under the California list? Y _____ N _____
2. Is this waste produced in the manufacture of pesticide/herbicide products? Y _____ N _____ Does this waste contain pesticide/Herbicide products? Y _____ N _____
3. Is this waste RCRA? Y _____ N _____ EPA Code _____ 40 CFR 268 Restricted Waste? Y _____ N _____ CA Restricted Waste? Y _____ N _____
   CA hazardous waste? Y _____ N _____ DHS code _____ Extremely Hazardous Waste? Y _____ N _____ Permit # _____
   Expiration date of permit _____ D.O.T. Proper Shipping Name _____ UN/NA# _____
4. If you answered yes to questions 1 or 2, . . .DO NOT CONTINUE. Please contact your GSX Technical Representative for assistance.

Chemical Constituents (Must Total 100%)	%

DRAFT

(Please Attach All MSDS's, Sample Analysis and Additional Info.)

Physical Characteristics at 70°F

Physical State: Liquid _____ Semisolid _____ Solid _____
Layers: None _____ Two _____ Multilayers _____
Free Liquids (%) _____ Precipitated Solids (%) _____
Viscosity: Low _____ Medium _____ High _____
Is Material Pumpable? Y _____ N _____ Polymerizable? Y _____ N _____
Specific Weight (lbs./gal) _____ / OR Specific Gravity (g/cc) _____
Physical Description _____ Odor _____
Flash Point (cc): Exact _____ <60°F _____ 61° - 100°F _____
101°F - 140°F _____ 141°F - 200°F _____ >200°F _____
BTU/lb. _____ Ash (%) _____ Water (%) _____
pH (avg) _____ Range _____ to _____
Reactivity (Reactive with): _____

Metals (ppm)

	Total	EP
As		
Ag		
Cd		
Ba		
Pb		

	Total	EP
Cr (Total)		
Cr (Hex)		
Hg		
Se		

	Total
Cu	
Tl	
Sb	
S	
P	

	Total
Si	
V	
N	
Zn	
Org Pb	

Other: (Specify in PPM)
Total Cyanide _____ PCB's _____
Total Sulfide _____ TPH _____
TOX _____ BTX _____

Total Organic Halogens (%)
Flourine _____ Bromine _____
Chlorine _____

CERTIFICATION: I hereby certify that to the best of my knowledge the above information and attachments fully and accurately characterize the chemical and physical properties of the waste stream. The sample that is delivered is a representative sample per EPA SW-846. I understand that acceptability and price estimates based on this sample may change according to the composition of actual waste received.

Generator's Signature X _____ Date _____

Information completed by:
Name _____
Title _____

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EXHIBIT 2.3-2

CUSTOMER NOTIFICATION AND CERTIFICATION

(DRAFT)

EXHIBIT 2.3-2

GSX Services of California

d.b.a. *LAIDLAW* Environmental Services

CUSTOMER NOTIFICATION AND CERTIFICATION

DRAFT

Only Statements with Original Signature will be Accepted

Generator Name/Location: _____

EPA I.D. Number: _____

Waste Profile or ARF Number: _____

Manifest Number: _____

EPA Hazardous Waste Number(s): _____

Waste Analysis Available? YES _____ NO _____ If yes, please attach copy.

WASTE ANALYSIS INFORMATION MUST BE ATTACHED TO THIS NOTIFICATION FORM
(if analysis was used to make the waste determination & certification)

_____ Unrestricted Waste Notification (Category 1)
I notify that I personally have examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this notification that the waste is not restricted as specified in 40 CFR 268, Subpart D and all applicable prohibitions set forth in 40 CFR 268.32 or RCRA Section 3004(d).

_____ Restricted Waste Notification (Category 2)
I notify that I personally have examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this notification that the waste does not comply with the treatment standards specified in 40 CFR 268, Subpart D. Waste must be treated by the appropriate regulatory treatment standard or in such a manner which renders it non-liquid by chemical fixation or solidification prior to land disposal.
Corresponding treatment standard _____.

_____ Restricted Waste Variance Certification/Notification (Category 3)
I notify pursuant to 40 CFR 268.7(a)(3) and certify under penalty of law that I personally have examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this certification that the waste complies with the treatment standards specified in 40 CFR Part 268, Subpart D and all applicable prohibitions set forth in 40 CFR 268.32 or RCRA Section 3004(d). I believe that the information I submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment.
Applicable variance _____

_____ Treated Waste Certification (Category 4)

_____ (4a) I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification and that, based on my inquiry of those individuals immediately responsible for obtaining this information, I believe that the treatment process has been operated and maintained properly so as to comply with the performance levels specified in 40 CFR part 268, Subpart D, and all applicable prohibitions set forth in 40 CFR 268.32 or RCRA section 3004(d) without impermissible dilution of the prohibited waste. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment.

_____ (4b) I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification and that, based on my inquiry of those individuals immediately responsible for obtaining this information, I believe that the nonwastewater organic constituents have been treated by incineration in units operated in accordance with 40 CFR Part 264, Subpart O or Part 265, Subpart O, or by combustion in fuel substitution units operating in accordance with applicable technical requirements, and I have been unable to detect the nonwastewater organic constituents despite having used best good faith efforts to analyze for such constituents. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment.

_____ Restricted Waste Notification (Category 5)
I notify that I have personally examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this notification that the waste does comply with the treatment standards specified in 40 CFR 268, Subpart D.

SIGNATURE: _____ DATE: _____

PRINT NAME: _____ TITLE: _____

Only Original Signatures will be Accepted

BFI Services of California
d.b.a. LAIDLAW Environmental Services

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LAB PACK CERTIFICATION

Generator Name/Location: _____

EPA I.D. Number: _____ Manifest Number: _____

Drum Number, Waste Profile Or ARF Number	Category Number	State EPA Waste Number(s)	Corresponding Treatment Standard/ Applicable Variance/Other Information

____ Category 6 - Lab Pack Certification

____ (6a) Organometallic (inorganic)
I certify under penalty of law that I personally have examined and am familiar with the waste and that the lab pack contains only the wastes specified in Appendix IV to Part 268 or solid wastes not subject to regulation under Part 261. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine or imprisonment.

____ (6b) Organic
I certify under penalty of law that I personally have examined and am familiar with the waste through analysis and testing or through knowledge of the waste and that the lab pack contains only organic waste specified in Appendix V to Part 268 or solid wastes not subject to regulation under Part 261. I am aware that there are significant penalties for submitting a false certification, including possibility of fine or imprisonment.

SIGNATURE: _____ DATE: _____

PRINT NAME: _____ TITLE: _____

Only Original Signatures will be Accepted

GSX Services of California
d.b.a. *LAIDLAW* Environmental Services

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NON-RCRA (CALIFORNIA ONLY) RESTRICTED WASTE NOTIFICATION

____ Non-RCRA California Only Restricted Waste Subject to Two Year Capacity Extension (Category 7):

"I certify under penalty of law that I personally have examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this certification that this waste is non-RCRA (California Regulated Only) which is subject to a two (2) year capacity extension to the implementation date of the treatment standard(s) listed below. This capacity extension was granted by the California Department of Health Services pursuant to Health & Safety Code Section 25179.7. After May 8, 1992, this waste must be treated to meet the treatment standards referenced below prior to the land disposal of this waste. I believe that the information I submitted is true, accurate and complete. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine or imprisonment."

The appropriate description(s) of the non-RCRA hazardous waste as referenced in 22 CCR Section 67702(b), the associated treatment standard(s) that characterize the waste and the California Waste Code(s) for the waste are as follows: (mandatory, check one or both sub-categories as appropriate)

____ Category 7a: METAL-CONTAINING SOLID WASTES check if applicable

22 CCR 67702 (b) (7) "Metal-Containing Solid Wastes" considered hazardous under 22 CCR 66699 (b)

22 CCR 67755 (b) (3) Treatment Standards expressed as maximum concentration of waste or treated waste residual extract using WET procedure: Table CCWE II-C

Metal analyte	Concentration (mg/l)	Metal analyte	Concentration (mg/l)
Antimony	15.0	Lead	67.0
Arsenic	15.0	Mercury	0.2
Barium	100.0	Molybdenum	350.0
Beryllium	0.75	Nickel	20.0
Cadmium	1.0	Selenium	1.0
Chromium (VI)	5.0	Silver	5.0
Chromium (III)	560.0	Thallium	7.0
Cobalt	80.0	Vanadium	24.0
Copper	230.0	Zinc	250.0

____ Category 7b: **ORGANIC CONTAINING SOLID WASTES** check if applicable

22 CCR 67702 (b) (11) "Non-RCRA Solid Waste Containing Organics" which are considered hazardous under 22 CCR Article 11 criteria.

22 CCR 67786 (a) Treatment Standards expressed as waste concentrations:

(1) $\leq$ 1% oil and grease

(2) $\leq$ 25.0 ppm volatile organics

(3) $\leq$ 435.0 ppm semi-volatile organics

22 CCR 67786(b) Treatment Standards expressed as treatment technology:

"Except for incineration in an incinerator with a destruction removal efficiency of 99.99%, a solid hazardous waste containing organics identified in 22 CCR 67702 that cannot be detected by EPA Methods 8240 and 8270 shall be treated with a solvent extraction, critical fluid extraction, thermal separation unit, or an alternative treatment method pursuant to Health and Safety Code Section 25179.6 (b) (2)."

>>>> **California Waste Code(s):** _____
(must be completed for Category 7 wastes) (see reverse side of manifests)

SIGNATURE: _____ DATE: _____

PRINT NAME: _____ TITLE: _____

Only Original Signatures will be Accepted

GSX Services of California

d.b.a. *LAIDLAW* Environmental Services

DRAFT

NON-RCRA (CALIFORNIA ONLY) RESTRICTED WASTE NOTIFICATION

____ **ASBESTOS (Non-RCRA, California Only Waste) Treated Waste Notification and Certification (Category 8):**

"I certify under penalty of law that I personally have examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this certification that the (asbestos) waste complies with the treatment standards specified in CCR Title 22, Division 4, Chapter 30, Article 41. I believe that the information I submitted is true, accurate and complete. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine or imprisonment." This non-RCRA hazardous waste is restricted under a {reserved} listing in 22 CCR 67702(b).

>>>> **California Waste Code(s):** _____
(must be completed for Category 8 wastes) (see reverse side of manifest)

Note 1: Non-RCRA California Only hazardous wastes other than those found in Categories 7a, 7b, or 8 above (such as non-RCRA metal containing aqueous wastes restricted under 22 CCR 67702(b)(1), non-RCRA aqueous and liquid organic wastes restricted under 22 CCR 67702(b)(10) and PCB containing wastes restricted under 22 CCR 67702(b)(2)) are not currently accepted at the Laidlaw Environmental Services facilities located in California and are thus not included on this form.

Note 2 Non-Hazardous wastes do NOT need to be accompanied by a Restricted Waste Notification and Certification form in order to be accepted for secure land disposal at a Laidlaw Environmental Services facility.

Note 3: For more information regarding restricted waste notification and certification requirements for non-RCRA California Only hazardous wastes, contact your nearest Laidlaw Environmental Services sales or customer services representative. You may also want to contact the California Department of Health Services' Offices of Legislation and Regulations, at (916) 327-1190, or the Alternative Technology Section - Land Disposal Restrictions Group, at (916) 322-3501, for additional information and/or waste specific interpretation of the California land disposal restriction program requirements.

SIGNATURE: _____ DATE: _____

PRINT NAME: _____ TITLE: _____

Only Original Signatures will be Accepted

EXHIBIT 2.3-3

CHAIN-OF-CUSTODY RECORD

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EXHIBIT 4.3-3

CHAIN-OF-CUSTODY RECORD

R/A Control No. _____

C/C Control No.

PROJECT NAME/NUMBER _____ LAB DESTINATION _____

SAMPLE TEAM MEMBERS _____ CARRIER/WAYBILL NO. _____

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.

Special Instructions: _____

Possible Sample Hazards: _____

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: _____ 3. Relinquished By: _____

Received By: _____ Received By: _____

2. Relinquished By: _____ 4. Relinquished By: _____

Received By: _____ Received By: _____

WHITE - To accompany samples

YELLOW - Field copy

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EXHIBIT 2.3-4

PREDISPOSAL ANALYTICAL REPORT (PDA)
(DRAFT)

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EXHIBIT 2.3-4

PREDISPOSAL ANALYSIS REPORT

WORK ORDER # _____
JOB # _____
SAMPLE # _____ OF _____

Generator Name: _____

Waste Description: _____

Generating Process: _____

Volume/Frequency: _____

TEST	RESULT	UNITS
HCVP		
DENSITY		
PH		
NORMALITY		
CN		
SULFIDE		
AMMONIA		
FLUORIDE		
XS OXIDANT		
FLASHPOINT		
AQUEOUS		
SOLID		
OIL		
HALOGENATED		
PHENOL		

RESULTS BY OC ANALYSIS

TEST	RESULT	UNITS
PCB		
HALOGENATED		

RESULTS BY ICAP ANALYSIS

TEST	RESULTS TOTAL	RESULTS DISSOLVED
Tl		
As		
Hg		
Se		
Pb		
Cd		
Ni		
Cr		
Cr+6		
Be		
Cu		
Fe		
Co		
Zn		

ANALYSIS

Name	Date

LAB MANAGER: _____ DATE: _____

ACCEPT/REJECT: _____ REASON: _____
TSDF MANAGER: _____ DATE: _____
TSD FACILITY: _____ SPECIAL SCHEDULING REQ: _____

TREATABILITY STUDIES/PLACEMENT:

White - Data Mgmt. Yellow - Operations Pink - Sales

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EXHIBIT 2.3-5

WASTE VERIFICATION INFORMATION FORM (WVI)
(DRAFT)

EXHIBIT 2.3-5
WASTE VERIFICATION INFORMATION FORM

ID Code:
EPA Waste ID#: (If Applicable)

DRAFT

Generator Name: _____

Waste Name or Type: _____

STATUS: Non-RCRA RCRA California Hazardous California Non-Hazardous

Physical Description: _____

Handling Instructions: Minimum: Goggles, gloves, boots, protective clothing (such as Tyvek) and respirator.

Sampling Procedures: If Vacuum Truck: Collect a sample from the top or bottom of the vacuum truck using coliwasa.

If Dump Truck: Collect a sample from the top of the bin or dump truck using a scoop.

Drum: Collect a sample through the bung using a Coliwasa.

Closed-bed truck: Collect two core samples through the access ports of the trailer.

Verification Procedures: (GSX sample identification #_____)

Required Tests	Results
A) Visual (#1)	Sample collected should resemble the Waste Verification Information Form
B) pH (#3)	Between _____ and _____
C) Total Sulfides (___)	Positive/Negative
D) Total Cyanide (___)	Positive/Negative
E) Free Liquids (___)	None Present/Should be Present
Hydrocarbon Vapor Pressure (___)	Between _____ and _____

Specific notes on test results: If one of the tests does not verify waste, contact the supervising chemist.

Unloading Instructions:

A) If verified as meeting criteria, place this waste into a landfill.

B) If verified as not meeting criteria, this waste must be directed to the STU.

Treatment Process Information: _____

Treatment Process Verification: _____

Waste Category Number: _____

EXHIBIT 2.3-6

GENERATOR NOTIFICATION

EXHIBIT 2.3-6

GSX Services
EWI Facility
P.O. Box 787
3500 Lokern Road
Buttonwillow, CA 93206
(805) 762-7372

June 29, 1990

Christina Galuga
Southern California Gas
237 S. Uruapan Street
Dinuba, CA 93618

RE: Soil, Debris and asphalt contaminated with hydrocarbons

Dear Ms. Galuga:

This letter is to inform you that GSX Services (Lokern Facility) has the appropriate permits for and will accept the waste identified above. Should any significant changes occur in this specific waste stream from the time the test data and/or predisposal samples were shipped, please contact Marianna Buoni or myself prior to shipping.

We have assigned the following Waste Identification Number to this waste:

5421-750-N

This number must be written on the manifest accompanying each load of waste. If California Hazardous, place this ID number in Section 15 of the California Hazardous Waste Manifest.

Very truly yours,

David J. Blaesing
Waste Acceptance Specialist

DJB:lko

cc: Chris O'Harra

EXHIBIT 2.3-7

GENERATOR NOTIFICATION OF WASTE RECHARACTERIZATION

EXHIBIT 2.3-7

GSX Services of California, Inc.
Lokern Facility
2500 Lokern Road
P.O. Box 787
Buttonwillow, CA 93206
(805) 762-7372

July 5, 1990

Miriam Conner
Shell Oil Co.
3485 Pacheco Blvd.
Martinez, CA 94553

RE: Refractory lining fireboxes and columns

New GSX Recharacterization Number: 2665-750-N2
(Previous GSX Acceptance Number: 2665-750-N)

Dear Ms. Conner:

This letter is to inform you that the waste identified above has been recharacterized. The results of the recharacterization indicate no significant changes in the properties of this waste stream. Please use the new waste recharacterization number indicated above. If California Hazardous, place this ID number in Section 15 of the California Hazardous Waste manifest.

Should any significant changes occur in this specific waste stream from the time that this recharacterization occurred, please contact Marianna Buoni or myself prior to shipping any of the changed waste.

Very truly yours,

for David J. Blaesing
Waste Acceptance Specialist

DB:lko

cc: John Stockdale

DRAFT

EXHIBIT 2.3-8

SAMPLE WASTE TRANSMITTAL FORM
(DRAFT)

___ RCRA
___ HAZARDOUS - NON RCRA
___ NON HAZARDOUS

EXHIBIT 2.3-d

WASTE TRANSMITTAL FORM

LOAD # _____
LANDFILL OR TANK # _____
LANDFILL LOCATION _____

DATE: _____

WEIGHMASTER CERTIFICATE

I, _____, THIS IS TO CERTIFY that the following described commodity was weighed, measured, or counted by a weighmaster, whose signature is on this certificate, who is a recognized authority of accuracy, as prescribed by Chapter 7 (commencing with Section 12700) of Division 5 of the California Business and Professions Code, administered by the Division of Measurement Standards of the California Department of Food and Agriculture weighed on Cobern Road 7 miles west of Buttonwillow.

_____ MANIFEST NO. _____ QUANTITY bbls./lbs. _____ RATE bbs./lbs.

TRUCKING CO. _____ WASTE HAULER REGISTRATION NO. _____

TRUCK # _____ TRAILER Lic. # _____ TRAILER Lic. # _____

GENERATOR _____ COMPANY _____ LOCATION

I CERTIFY THAT THE DESCRIBED WASTE WAS HAULED BY ME TO THE DISPOSAL FACILITY NAMED ABOVE

WASHOUT: Regular _____ For Washout: Drivers's Initials _____ DRIVER'S SIGNATURE _____

TYPE OF WASTE: ☐ SOIL W/HC ☐ ROTARY MUD ☐ TANK BOTTOMS ☐ SCRUBBER WASTE OTHER _____

DESCRIPTION: SOLID _____ SLUDGE _____ LIQUID _____ PWI WASTE ID# _____

INCOMING WASTE SAMPLING PROCEDURE:

BY: _____

COLIWASA: _____

THIEF: _____

GRAB: Top _____ Bottom _____

SCOOP: _____

WASTE PILE SAMPLER: _____

TREATED WASTE SAMPLING PROCEDURE:

BY: _____

GRAB: Top _____ Bottom _____

SCOOP: _____

WASTE PILE SAMPLER: _____

WASTE VERIFICATION: ANALYST _____

TEST #	RESULT	YES	NO	TEST #	RESULT	YES	NO
pH (3)		___	___	HCVP (22)*		___	___
Vis. (1)		___	___			___	___
Free Liquid (21)	YES NO	___	___			___	___

COLOR: _____

COMMENTS: _____

*N.O. - No oil present

WEIGHMASTER BY: SIGNATURE OF WASTE DISPOSAL FACILITY OPERATOR/WEIGHMASTER _____ DEPUTY

TREATMENT PROCESS INFORMATION

The following ratio is to be followed to properly treat/stabilize the waste.

ADDITIVE	PARTS/RATIO
Waste	
Kiln Dust	
Cement	
Water	
Acid/Caustic (Normality)	
Other:	
Other:	

Batch Number: _____

FACILITY TECHNICIAN SIGNATURE: _____

TREATMENT/STABILIZATION TECHNICIAN SIGNATURE: _____

Parameters of interest.

	PRE-TREATMENT	POST-TREATMENT
As		
Tl		
Se		
Hg		
Pb		
Ni		
Cr		
Cd		
Be		
Sulfides		
Cyanides		
pH		
Free Liquids		
Organics		

I CERTIFY THAT THE ABOVE DESCRIBED WASTE WAS PROPERLY TREATED IN THE STABILIZATION/TREATMENT PLANT UNDER MY SUPERVISION

SIGNATURE _____ STABILIZATION/TREATMENT UNIT OPERATOR

I CERTIFY THAT THE ABOVE DESCRIBED WASTE WAS PROPERLY PLACED INTO THE DESIGNATED LANDFILL UNDER MY SUPERVISION.

SIGNATURE _____ FACILITY OPERATOR

PWI:PARTB-EX6

DRAFT

EXHIBIT 2.3-9

ICP DATA SHEET
(DRAFT)

EXHIBIT 2.3-9

ICP DATA SHEET

DATE: _____ ANALYST: _____

Sample	Tl	As	Hg	Se	Pb	Cd	Ni	Cr	Be	Cu	Units	Prep	Other
Cal. Blank													
Cal. Std.													
Weekly QC Sample													
Method Blank													
Spike													
Duplicate #1													
Check-Stnd.													
Duplicate #2													
Sludge QC Sample													

DRAFT

EXHIBIT 2.3-10

GC DATA SHEETS
(DRAFT)

EXHIBIT 2.3-10

VOLATILE HALOGENATED HYDROCARBONS DATA SHEET

Channel: _____
Instrument: _____
Detector: _____

DATE: _____ SHIFT: _____

Spl. ID	$MeCl_2$	Freon113	111-TCA	TCE	Perc.	PhCl	$CHCl_3$	EDC	CCl_4	EDB		File Result #	Anal

Include, in chronological order, the results for all standards, blanks, samples, spikes and duplicates. List the percent recovery for all spikes and the duplicate percent difference for all duplicate analyses.

Dup. % difference = (Range/Avg)*100

EXHIBIT 3-10 (Continued)

PHENOL/CRESOL DATA SHEET

Data Channel: 5
Instrument: Varian 3700 Port B

DATE:_____ SHIFT:_____

Sample No./Type	Phenol	o-Cresol	m-Cresol	p-Cresol	Units	File Rec. No.	Analyst

This data sheet is to include the results for all standards, blanks, samples, spikes and duplicates. Entries should be chronological. Spike results should be listed as percent recovery. Duplicate results should include % difference

EXHIBIT 2.3-10 (Continued)

Instrument: _____ PCB DATA SHEET DATE: _____ SHIFT: _____

CHANNEL No. : _____ CHANNEL No.: _____

Sample # or Type	AR 1016	AR 1021	AR 1032	AR 1242	AR 1248	AR 1254	AR 1260	Filter	AR 1016	AR 1021	AR 1032	AR 1242	AR 1248	AR 1254	AR 1260	Filter	ke

Include, in chronological order, the results for all standards, blanks, samples, spikes and duplicates. List the percent recovery for all spikes and the duplicate percent difference for all duplicate analyses.

% Difference = (Range/Avg)*100

DRAFT

EXHIBIT 2.3-11

pH CALIBRATION LOG
(DRAFT)

EXHIBIT 2.3-11

pH

CALIBRATION LOG PAGE

DATE	ANALYST	pH BUFFER LEVEL & READING 4	7	10	COMMENTS	CHECKED BY/DATE

Figure NC6-5

Date: September 27, 1990
Revision No. 5

EXHIBIT 2.3-12

INTERNAL TEST METHODS

LAIDLAW ENVIRONMENTAL SERVICES, LOKERN FACILITY

Date: September 27, 1990
Revision No. 5

EXHIBIT 2.3-12

TEST 22
FLAMMABILITY BY HYDROCARBON VAPOR PRESSURE

1. Principle

Samples containing oil or other flammable hydrocarbons produce combustible vapors. The gas detector quantifies the vapors (in ppm) by drawing the vapors over a bead catalytic sensor. The hydrocarbon concentration can be determined down to 20 ppm. This concentration is roughly proportional to the observed closed-cup flashpoint. Knowing (within a tolerance factor) what concentration of combustible gases gives a flashpoint of approximately 140°F, the flashpoint of a waste sample can be estimated by the concentration of the combustible gases produced.

2. Scope and Application

This test is applicable to any type of sample emitting a combustible gas.

3. Apparatus

Sniffer 503 - portable combustible gas meter. manufactured by Bacharach (or equivalent).

4. Sample Collection

Liquids: Collect with a Coliwasa. Solids: Collect sample with a scoop or waste pile sampler. Sample containers should remain sealed prior to analysis.

5. Procedure

Turn the power switch to "battery" position. The needle position indicates whether the battery is charged or not. If the battery is not sufficiently charged up, connect the meter

EXHIBIT 2.3-12
(Continued)

to a power source. Allow the battery pack to recharge for hours.

5.2 For a determination, allow the combustible gas meter to stabilize for one minute. Check the zero by turning the control knob to the "X 20 ppm" position. Unlock the zero and adjust the meter to read "zero" with the intake funnel pointed to an odor and vapor free area. Place the funnel (3" wide) over the open sample container. Be sure that the funnel covers the entire container. Allow the hydrocarbon vapor reading to stabilize for approximately 30 seconds. Multiply the reading by the appropriate dilution used (x 100 ppm, x 20 ppm) to obtain final result.

Date: September 27, 1990
Revision No. 5

EXHIBIT 2.3-12

(Continued)

CENTRIFUGATION OF WASTES

TEST METHOD 8105

(REV. 1.0, APRIL 1987)

1. Scope

This method is designed to determine the volume distribution of solid and liquid phases in pumpable waste materials.

2. Apparatus

2.1 Centrifuge, capable of spinning 50-ml tubes at 3,500 rmp.

2.2 Centrifuge tubes, 50-ml graduated, plastic, with screw caps.

2.3 Sampling aids, e.g., glass tube, 30 cm long, 1 cm ID, open on both ends; 50 ml breaker.

3. Procedure

3.1 In this determination, it is vital that the subsample being transferred to the centrifuge tube is a representative portion of the total sample. Make sure all phases of the material (light, liquid, emulsion, interface, sediments, etc.) are represented in the centrifuge tube in the same proportions as they are in the total sample. No single method of subsampling is applicable to all wastes. One that often works follows.

3.1.1 Stir up the contents of the sample container and quickly dip the open glass tube in the sample, close the tube top and withdraw the subsample in pipet fashion. Empty the tube into the centrifuge tube. Repeat with stirring, until

approximately 50 ml have been transferred. Do not top off to exactly 50 ml, as this will usually not add a representative amount.

3.1.2 Close the centrifuge tube with a screw cap and place the tube into the centrifuge tube holder, across from an equal weight ballast.

3.1.3 Spin the sample at 300 to 3,500 rmp for three minutes.

3.1.4 Read the ml divisions in the spun-down tube at the interfaces between layers.

4. Calculations

Calculate the thickness of each layer and express it as a volume percent of the total volume in the tube.

Date: September 27, 1990
Revision No. 5

EXHIBIT 2.3-12
(Continued)

TEST FOR COMPATIBILITY FOR TREATMENT/DISPOSAL
TEST METHOD 8503
(REV. 2a - AUGUST, 1987)

1. Scope and Application

Method 8503 is used to determine the compatibility and reactivity of a material with previously disposed material.

2. Summary of Method

A representative sample of the waste to be evaluated is mixed with a representative sample of the area of the disposal facility where the waste is to be placed. This is to establish compatibility of the materials. Additionally, a small amount of water is added to the mixture to determine whether the mixture of material will not be reactive. Chemical and physical reactions between wastes and changes in the waste mixture are noted.

3. Apparatus

3.1 Mixing apparatus consisting of an inert container and stirring device such as a spatula.

3.2 Thermometer capable of readings of 0-100 $\pm$ 0.5 degrees C.

3.3 Approximately 10 ml of water with a dispensing device.

3.4 Safety equipment as appropriate.

4. Sample Collection

4.1 Sampling from a landfill will be carried out on a daily basis, as specified for sampling a landfill per EPA SW-846.

EXHIBIT 2.3-12
(Continued)

4.2 Sampling from a tank will be carried out as needed specified for sampling a tank per EPA SW-846.

4.3 Sampling of the waste movement under evaluation will be carried out in conformance with EPA SW-846.

4.4 A representative sample of the waste will be obtained by mixing and compositing as necessary.

5. Procedure

5.1 A portion of the sample to be evaluated is mixed in a 250 ml container with a portion of the representative sample in a 1:10 ratio.

5.2 The chemist will monitor and note for a one-minute period the temperature, physical appearance, and state of the material.

5.3 After the one-minute period, the chemist will add to the mixture (drop wise) approximately 10 ml of water. Again, he will monitor and note for a one-minute period the temperature, physical appearance and state of material.

5.4 The chemist will note and evaluate the evolution of gas, creation of a liquid phase, formation of vapors or bubbles, or color changes.

6. Evaluation

The chemist will evaluate the results of the test, the chemical and physical properties of the waste, material known to be in the area where the waste is to be placed, to determine the compatibility and reactivity of the material to be placed.

Date: September 27, 1990
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EXHIBIT 2.3-12
(Continued)

TEST 8D
TEST FOR REACTIVE SULFIDE

1. Principle

An acidic solution, buffered to a pH of 2.0, releases the reactive sulfide compounds as hydrogen sulfide. The hydrogen sulfide gas reacts with the lead in lead acetate paper, forming black lead sulfide.

2. Scope and Application

This test will detect the presence of reactive sulfide compounds. This test would not detect the presence of non reactive sulfide compounds that do not generate hydrogen sulfide upon exposure to a low pH.

3. Apparatus

3.1 Lead Acetate paper strips.

3.2 250 ml flask with stopper.

4. Reagents

4.1 Phosphoric Acid/sodium phosphate buffer solution - pH of 2.0.

5. Procedure

Perform this test only under a hood. Do not breathe any of the fumes coming from the test sample.

5.1 Place approximately 5 grams or ml of sample into a flask. Add 10 milliliters of the phosphate buffer solution (pH 2.0). Quickly place a rubber stopper in the neck of the flask, with a lead acetate paper strip held in place by the stopper. Mix well by swirling.

EXHIBIT 2.13-12
(Continued)

5.2 Allow the sample to sit for 5 minutes. If a brown stain develops on the strip, reactive sulfide is present. If no color develops, no reactive sulfide is present.

6. Precautions

This procedure must be done by persons wearing gloves and goggles working under a hood. Hydrogen sulfide is a toxic gas.

7. Reference

7.1 SW-846, Third Edition, Test 7.3.3.3.

7.2 Standard Methods 428, Sulfide.

Date: September 27, 1990
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EXHIBIT 2.3-12
(Continued)

TEST 9A
SCREENING TEST FOR FREE CYANIDE

1. Principle

Hydrogen cyanide gas, evolved from the acidified sample, reacts with a ferrous sulfate and sodium hydroxide impregnated Strip of test paper suspended over the sample in a closed container. Hydrogen cyanide produces a blue stain on the test paper due to the formation of ferric ferrocyanide (Prussian Blue).

2. Scope and Application

2.1 The conditions used in this screening test will detect only the simple cyanides such as the alkali and alkaline earth cyanides.

2.2 To determine total cyanides, the sample must be distilled by refluxing with sulfuric acid and a catalyst for an hour.

3. Apparatus

3.1 125 or 250 Erlenmeyer flasks with rubber stopper

3.2 pH test beaker

3.3 One liter beaker

3.4 Filter paper, Whatman No 1 or equivalent, 20x20 cm sheet

4. Reagents

4.1 10% Ferrous sulfate solution: Dissolve 5.0 g $FeSO_4$ in water and make up to 50 ml. Add two drops of 1 x 1 sulfuric acid solution. Let stand for one hour. Filter if necessary.

4.2 Sodium hydroxide solution in alcohol, 10% (w/v). Dissolve 5.0 g NaOH in 5-10 ml water. Make up to 50 ml with 95% ethanol.

EXHIBIT 2.3-12
(Continued)

4.3 Hydrochloric acid solution (1 + 2): Mix 10 ml concentrated HCl with 20 ml water.

4.4 Sulfuric acid solution (1 + 2): Carefully and slowly mix 20 ml concentrated H_2SO_4 with 40 ml water.

4.5 Stock cyanide solution, 1000 mg/L: Add 2.51 g potassium cyanide (KCN) to 100 ml water in a 1 L volumetric flask. Add 2.0 g potassium hydroxide (KOH) and make up to mark with water.

4.6 Dilute standard solutions: Prepare 100 ml each of 1.0, 10.0 and 50.0 ug/ml cyanide solutions from the stock solution.

5. Preparation of Test Strips

From the sheet of filter paper, cut individual strips 0.5 cm wide x 10 cm long. Immerse the end of each strip to a depth of about 1 cm in the ferrous sulfate solution for about 10 seconds. Remove from the solution, air dry and store in a low actinic bottle, and in the dark.

6. Procedure

NOTE: The test should be done in a hood on in a well ventilated area.

6.1 Place 10.0 g (solid) or 10.0 mL (liquid) sample in the Erlenmeyer flask. Add 10 mL of deionized water if the sample is a solid and mix. Take a prepared test strip and immerse the strip's sensitized portion in the sodium hydroxide solution. Remove and blot the excess solution.

6.2 Add 5 mL 1 + 2 sulfuric acid solution to the sample. Immediately suspend the test strip to about 1" above the surface of the sample. Insert the rubber stopper into the mouth of the flask to hold the test paper in place. Mix the sample gently. Place hot water (from the top) to

EXHIBIT 2.3-12
(Continued)

a one inch depth in a one liter breaker. Place the flask in the hot water for five minutes. Alternatively, a hot plate can be used.

6.3 Remove the test strip and immerse the sensitized end in 1 + 2 hydrochloric acid solution for five minutes. Rinse test strip and with water and air dry.

6.4 Using a 10 ml sample and five minutes heating time, the detection limit for this test is between 1 - 5 ppm (closer to 1 ppm). Five ppm yields a light blue color along all the sensitized portion of the strip. One ppm yields a light blue coloring on the edges of the strip.

6.5 To establish that the cyanide screening test is working, spike a 10 ml portion of fresh sample with 10 ml of 10 ppm cyanide solution. Perform the screening test. Detection of cyanide indicates that the test is functioning properly. if no cyanide is detected, that probably is an indication that something in the sample is reacting with the free cyanide, converting it to another compound. If this is the case, there is not any free cyanide present in the original sample.

7. References

7.1 Sunshine, Handbook of Analytical Toxicology, The Chemical Rubber Company, pp. 403, Table 9.

7.2 Gettler, Goldbaum, Detection and Estimation of Microquantities of Cyanide, Analytical Chemical 19, 270, April, 1947.

7.3 Amerine, Laboratory Procedure for Ecology, p. 80, University of California, College of Agriculture, Department of Viticulture and Ecology, August, 1955.

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EXHIBIT 2.3-12
(Continued)

8. General Notes

8.1 If the sample is highly buffered, and no cyanide is found, check the pH of the acidified sample with pH paper after performing this test. If the pH is not below 2.0, rerun the test using more acid (10 ml). Continue until enough acid is added to lower pH to below 2.0. This will ensure that cyanide present will generate gas.

8.2 For a more sensitive test, use a larger amount of sample (and correspondingly more acid).

8.3 On the heating step, a hot plate setting of 1-1/2 is suggested.

8.4 Samples containing large amounts of compounds that give off gases when acidified (such as bicarbonates, thiosulfates, etc.) must be treated carefully. Do not force the rubber stopper in so hard that the glass shatters before the stopper pops out.

8.5 Samples shown to contain cyanide by this test will be considered reactive with respect to cyanide.

Date: September 27, 1990
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EXHIBIT 2.3-12
(Continued)

4. Procedure

4.1 Place 5 grams of sample (solids or liquid) in a 250 ml Erlenmeyer flask.

4.2 Add 10 ml 0.5% lead acetate solution. Stopper and shake by swirling.

4.3 Sensitize the treated end of the cyanide test strip with 2-3 drops of 10% sodium hydroxide. Blot any excess solution off but be sure to keep the strip moist.

4.4 To the sample, add 10 ml of phosphate buffer (pH 2.0) solution. Stopper the flask with the sensitized strip wedged between the stopper and the flask. Mix well by swirling.

4.5 Remove the strip after 5 minutes and immerse it in 1:2 HCl solution for one minute. Rinse the strip with deionized water and note the color development. A blue color indicates the presence of reactive cyanide. If no blue color forms, no reactive cyanide is present.

5. Precautions

This procedure must be done by persons wearing gloves and goggles under a hood. Care must be take when using acids (corrosive). Hydrogen cyanide gas is poisonous.

6. Reference

6.1 Sunshine, Handbook of Analytical Toxicology, The Chemical Rubber Company, pp. 403, Table 9.

6.2 Gettler, Goldbaum, Detection and Estimation of Microquantities of Cyanide, Anal. Chem. 19, 270, April, 1947.

6.3 Amerine, Laboratory Procedure for Ecology, p. 80. University of California, College of Agriculture,

EXHIBIT 2.3-12
(Continued)

Department of Viticulture and Ecology, August, 1955.

6.4 SW-846, Second Edition, Test 7.3.3.2.

Date: September 27, 1990
Revision No. 5

EXHIBIT 2.3-12
(Continued)

TEST 8a
SCREENING TEST FOR TOTAL SULFIDE

1. Principle

Sulfuric acid releases the sulfide compounds as hydrogen sulfide (a gas). The hydrogen sulfide gas reacts with the lead in the lead acetate paper, forming black lead sulfide.

2. Scope and Application

This test will detect the presence of water soluble and insoluble sulfide compounds capable of liberation as hydrogen sulfide by acids. This test would not detect the presence of sulfide compounds that are not converted to H_2S upon exposure to a low pH.

3. Apparatus

3.1 Lead Acetate paper strips (Test paper #1)

3.2 250 ml flask with stopper.

4. Reagents

10% sulfuric acid (Reagent #4): Carefully add 50 ml of concentrated sulfuric acid to 450 ml of deionized water. Add the acid slowly, to avoid generating large amounts of heat.

5. Procedures

NOTE: Perform this test only under a hood. If the test is positive, hydrogen sulfide gas (a toxic gas) is generated. Do not breathe any of the fumes coming from the test sample. Also, do not get any sulfuric acid on skin or in eyes.

5.1 Place approximately 5 grams or ml of sample into flask. Add quickly 3 squirts of Reagent #4 (10% sulfuric acid). Place a rubber stopper in the neck of the flask, with a lead acetate paper strip (Test paper #1) held in place by the stopper.

EXHIBIT 2.3-12
(Continued)

5.2 Allow the sample to sit like this for five minutes. The reaction can be speeded up by placing the flask in hot water. If a dark brown stain develops on the strip, the test is positive. If no color develops, the test is negative. A light brown color (slightly positive) indicates the presence of low levels of sulfide.

5.3 For liquid samples (with no solids), the test can be run by simply placing a lead acetate paper strip into the sample liquid. If a darkening of the strip is observed (brown or black), the test is positive, indicating that the liquid contains sulfide compounds.

5.4 Liquids with sulfide present in them should undergo quantification of the sulfide levels or be tested for reactive sulfides.

6. General Notes

6.1 If the sample is highly buffered, and no sulfide is found, check the pH of the acidified sample with pH paper. If the pH is not below 2.0, rerun the test using more sulfuric acid. Continue until enough acid is added to lower the pH to below 2.0. This will ensure that sulfide present will generate gas. For a more sensitive test, use a larger amount of sample (and correspondingly more acid). On the heating step, a hot plate setting of 1-1/2 is suggested.

6.2 For the low level sulfide method in Section 5.1, samples containing large amounts of compounds that give off gases when acidified (such as bicarbonates, thiosulfates, etc.) must be treated carefully. Do not force the rubber stopper in so hard that the glass shatters before the stopper pops out.

EXHIBIT 2.3-12
(Continued)

TEST 13
SCREENING FOR SODIUM THIOSULFATE

TEST ID: Stretford/Thiosulfate
WASTE TYPE: Stretford gas scrubber waste.

1. Principle

The sodium thiosulfate present in Stretford liquor reacts with potassium iodate in the test paper, forming elemental iodine, which reacts with the starch present in the test paper to form a blue color.

2. Description of Waste

Dark red to purple liquid. May appear dark brownish if other wastes are mixed in. Fine white or yellow solids may be present (elemental sulfur).

3. Test Procedure

One squirt of sample is placed into a small glass beaker. One squirt of Reagent #4 (10% sulfuric acid) is added. At this point, the waste should bubble (carbon dioxide) and the hard reddish-brown-purple color should change to light green. Place a piece of Test Paper #2 (potassium iodide/iodate paper) into the test liquid. If the waste contains some Stretford gas scrubber waste, the test paper will remain white. NOTE: This test should work even if some other wastes (such as oil or FCC catalyst fines) have been mixed in. NOTE: The pH must be below 6.0. If the test doesn't work, check the pH with pH paper to make sure the pH is low enough. If the pH is found to be above 6.0, add more acid (10% sulfuric acid).

NOTE: Stretford waste is gas scrubber waste and is usually

EXHIBIT 2.3-12
(Continued)

identified on the manifest as having either Vanadium or Vanadate or ammonium vanadate.

Exhibit 2.3-12

Method 99

Test for Heat Generation Due to Reaction with Water

I. Principle

This test is used to determine whether an incoming waste generates heat when mixed with water.

II. Procedure

a) Weigh out 50 grams of sample in a small container.

b) Add 10 grams of deionized water to the sample and mix well with spatula. Mix until the water is evenly distributed throughout the sample.

c) Compact the mixed sample/water mixture into the bottom of its container. The bottom of another identical-sized container works well for this.

d) Place a thermometer as far into the sample/water mixture as is possible. The thermometer must make good physical contact with the sample/water mixture during this test.

e) The highest temperature reached during this 10 minute period is recorded as the result of this test.

III. Safety and QC

a) All appropriate safety gear should be worn.

b) This test should be performed under a hood.

c) The thermometer should be calibrated once per month. Use a correction factor if the calibration is off more than 5°F at 212°F, the boiling temperature of water.

Revised July 6, 1990

testhtgn.lst

Measuring Temperature of Incoming Waste

I. Principle

This test is used to characterize the temperature of any incoming waste that is obviously warmer than ambient temperature.

II. Procedure

a) Samplers should measure the temperature whenever the load seems to be at least 20 degrees warmer than ambient. In case of doubt, be cautious and perform the measurement.

b) Uncover at least one (1) foot of the top layer more than one foot away from the edge of the truck bed. Embed the thermometer then perform the remainder of the sampling.

c) Read and record the temperature after the rest of the sampling has been completed.

III. Safety and QC

a) All appropriate safety gear should be worn.

b) The thermometer should be calibrated once per month. Use a correction factor if the calibration is off more than 5º F at 212º F, the boiling temperature of water.

Date: September 27, 1990
Revision No. 5

EXHIBIT 2.3-13

WASTE VERIFICATION INFORMATION FORM
LOKERN FACILITY

EXHIBIT 2.3-13

IC CODE: _____
EPA ID#: _____
Not Applicable:
California Regulated Waste Only

Generator Name: _____

Waste Name or Type: _____

STATUS:

RCRA — California Hazardous
Non-RCRA — California Non-Hazardous

Physical Description: _____

Handling Instructions: Minimum: Goggles, gloves, boots, protective clothing (such as Tyvek and respirator).

Sampling Procedures: If vacuum truck: Collect a sample from the top or bottom of the waste in the vacuum truck using Coliwasa.

If dump truck: Collect a sample from top of bin or dump truck using scoop.

Verification Procedures:

Required Tests	Results
A) Visual (#1)	Sample collected should resemble the Waste Summary Form description.
B) pH (#3)	Between _____ and _____
C) Total Sulfides (#8 ___)	Positive/negative
D) Free Liquids (#21)	None present/should be present
E) Other: _____	_____

- Specific notes on test results: If one of the tests does not verify that the incoming waste load matches the original sample and information received from the generator, contact a chemist.

Unloading Instructions: (check one)

___ A) Place this waste, if verified as ok, into a landfill waste management unit suitable for solids.

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EXHIBIT 2.3-13

WASTE SUMMARY FORM
(Continued)

___ B) If verified as ok, this waste must be placed into a nonhazardous surface impoundment.

___ C) If verified as ok, this waste must be taken to the WSU/STU for treatment.

___ D) If verified as ok, this waste must be taken to the MITS for treatment.

___ E) Other: _____

PWI LAB #: _____

Misc. Information: _____

Waste Category Number: _____

U.S. DOT: Proper Shipping Name: _____

UNI NA #: _____

EPA Waste Code(s): _____

California Waste Code(s): _____

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EXHIBIT 2.3-14
WASTE VERIFICATION INFORMATION (WVI) FORM
Contaminated Soils and Non-soil Materials

ID Code: _____
EPA Waste ID#: Not Applicable
California Regulated Waste Only

Generator Name: _____

Generator Location: _____

Waste Name/Type: _____

Status: Non-RCRA RCRA California Hazardous California Non-hazardous

Physical Description: _____
_____

Handling Instructions: A minimum of goggles, gloves, boots, protective clothing (such as TYVEX) and respirator.

Sampling Procedures: Collect a sample from the top of the bin or dump truck using a scoop.

Verification Procedures:

Required Tests	Results
1) Visual (#1)	See WVI Form description.
2) pH (#3)	Between _____ and _____
3) Total Sulfides (#8__)	Positive / Negative (See note d)
4) Total Cyanide (#9__)	Positive / Negative
5) Free Liquids (#21)	None Present / Should be present
6) Absorbancy (#26)	PASS / Non-applicable (See note c)
7) Spec. Gravity (ASTM D1429)	Record on Weighmaster certificate

Notes on test results:

a) If waste is not verified by tests, contact the truck receiving supervisor.
b) Specific Gravity is required on all loads.
c) Absorbancy test is not applicable if waste is placed into landfill.
d) Use Test #9A if #8A is negative or #9B if #8A is positive.

Unloading Instructions: Place this waste, if verified as OK, into a non-RCRA waste management unit suitable for California hazardous / nonhazardous solids.

Laidlaw Lab #: _____ **Date Approved:** _____

US DOT Description: Hazardous Waste, Solid, ORM-E, NA 9189
Waste is non-hazardous

COMMENTS:

Rev:
Expires: